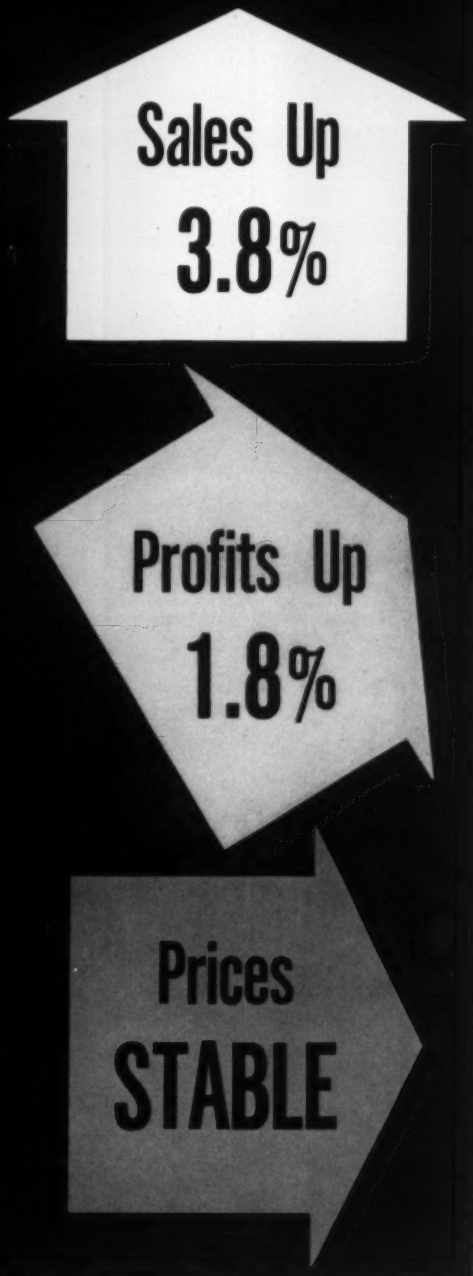


Those are three findings of a STEEL survey of 1600 metalworking executives, who told how they think their plants will fare in the second half vs. the first. Other results:

- **Employment will inch up.**
- **R&D spending will climb.**
- **Production capacity will be lifted 4.7 per cent.**

See Page 43 for other predictions.

STEEL

The

Metalworking Weekly

JUNE 27, 1960

A PENTON PUBLICATION

Look for Instrument Output To Rise Nearly 300% by 1980

1960 Steel Industry Capacities— A 16-Page Statistical Profile

How to Judge Hot Dip Galvanizing

Merchant Pig Iron Sales Coast Along

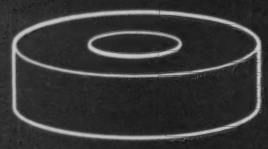
CONTENTS—TURN PAGE

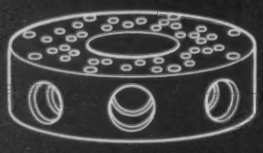
170 OPERATIONS

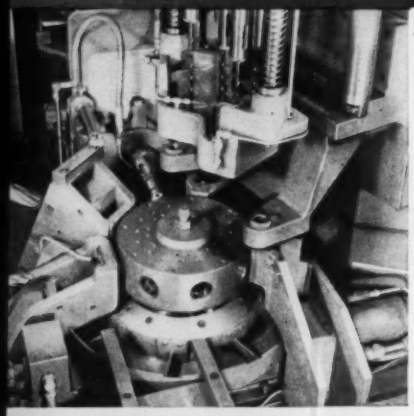
73 HOLES

starting from solid

- DRILL
- REAM
- BORE
- COUNTER-BORE
- GROOVE
- TAP

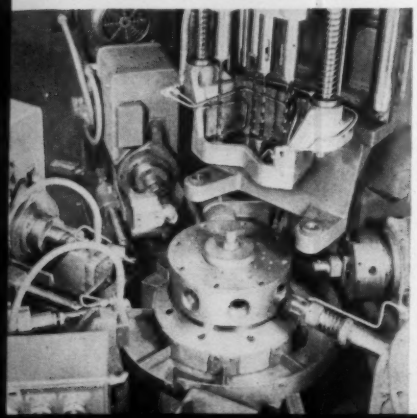






Above — Work stations on first machine (shown in large photo)

Below — Work stations on second machine



Two 6-station Model S Bore-Matics

UP PRODUCTION 519%

This cast-iron hydraulic motor body used to be produced on three different machines, with a total production time of 286 minutes per part. Now it is done on two 6-station Model S Bore-Matics in *46 minutes!*

Each machine is equipped with Heald Red Head Borizers to rotate and feed the tooling, and a rotary indexing workholding fixture. Once the part is loaded, all operations are performed in sequence in a fully automatic cycle. After operations on the first machine are completed, the work is turned over and put on the second machine where the remaining operations are finished from the opposite face.

This job demonstrates the unusual versatility of Heald Borizer units—and their ability to handle heavy stock removal while maintaining required accuracy for each of numerous sequential operations. For complete details on this particular application, send for a copy of the April 1960 issue of the "Heald Herald."

MMT-PE

It PAYS to come to Heald

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Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

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This Week in STEEL

The Metalworking Weekly

June 27, 1960 Vol. 146 No. 26

Look for Instrument Output to Rise

The big growth in instruments over the next two decades means that: Value added by manufacture will practically quintuple, to hit $13.4 billion; employees' average annual earnings will more than double, as will overall employment; instrument and related equipment prices may double as well. Here is the second of six metalworking growth studies prepared for STEEL. PAGE 54

How to Tell Good Hot Dip Galvanizing

The nature of the defects in hot dipped galvanized coating can give a clue to the source of the trouble. Some are in the steel, others derive from the galvanizer's practice. Thickness gage measurements, illustrated here, along with photomicrographs and visual inspection, are methods for tracking down trouble spots. Here, from the Midwest Job Galvanizers Association, are examples of what to look for in this metalworking process which is both science and art. PAGE 76

How to Mill the Tough Superalloys

Three major factors cause most of the trouble in machining high strength steels and thermal resistant alloys: Abrasiveness, temperature at the cutting edge of the tool, and work hardening of the metal. Here are the findings of a recent study on machining medium carbon alloys, austenitic and martensitic stainless. PAGE 89

1960 Steel Industry Capacities

Want to know how much steel can be finished, or who has the finishing and other production facilities? For the first time since 1957, steel finishing capacities for the U. S. and Canada have been reported by the American Iron & Steel Institute. Here are the kinds of facts and figures you can find and use in STEEL's special 16-page report:

U. S. ingot steelmaking capacity	148,570,970 net tons
U. S. hot rolling capacity	113,785,590 net tons
U. S. pig iron capacity	96,520,630 net tons
U. S. cokemaking capacity	72,309,700 net tons

PAGE 103

Merchant Pig Iron Sales Coast Along

Shipments this year may well fall below the 1950-59 annual average of 6.5 million net tons, but should equal or top the 5.4 million tons moved last year. That's the outlook of foundrymen and ironmakers, despite recent spotty foundry operations and curtailed blast furnace activity. A *Foundry* magazine survey reveals that foundry conditions are better than current reports would indicate: About 60 per cent of those queried find 1960 business has been as good as, or better than, anticipated. PAGE 123

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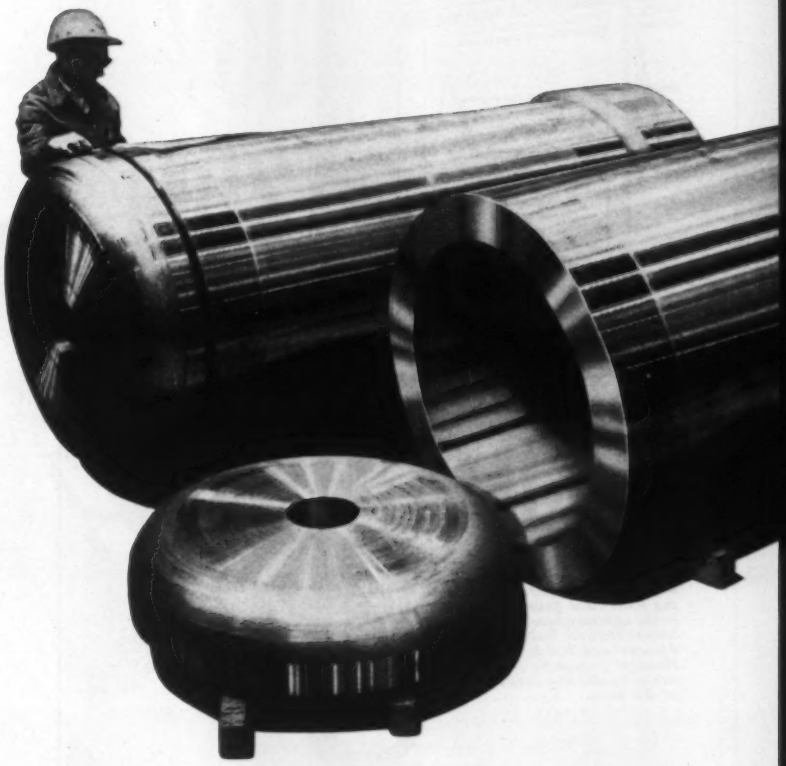
"Will the weld be as strong as the cylinder?"

Marion Power Shovel asked this question when we recommended two-piece forgings (at considerable savings over the former one-piece forgings) for use as jack cylinders in their giant electric shovels. We answered "yes" . . . and tests show the weld metal has higher mechanical properties than the minimum physicals required for the cylinder.



BECAUSE THE HOLE *at the cylinder end is small, machining the sleeve before the head is welded on is lots easier and faster than machining the former one-piece forging. There's more room to work; the tool can get a good grip on the piece, hog out the metal, instead of pick it out. The savings are more than enough to offset the added welding cost.*

FOUR FORGED-AND-WELDED *"equalizing" cylinders, like those above, are used to keep the upper frame of this Type 5761 Electric Shovel level during operation. Made by Marion Power Shovel, Marion, Ohio, this shovel's dipper has a 65 cu yd capacity.*

Forged from manganese-vanadium steel, this sleeve-and-head cylinder weighs 22,690 lb.

The sleeve itself is 9 ft, 10 in. long, with a body OD of 45 in. Flange OD is 48 in.; flange ID, 35¼ in. The wall is 5-in. thick. To produce it, we upset, punch, hollow-forge, double-normalize and temper. Then we finish-machine to size, including the weld bevel on the end of the sleeve.

We forge the head as a disc of 49 in. diameter, and 11-in. long. Then we finish-machine it to size (45-in. OD, 9¾-in. long), including the weld bevel, and treat it the same as the sleeve.

The two pieces are then assembled and welded. The cylinder receives a stress-relief anneal after welding, and the weld is radiographed to assure soundness. Excess weld on the OD and ID is then machined off.

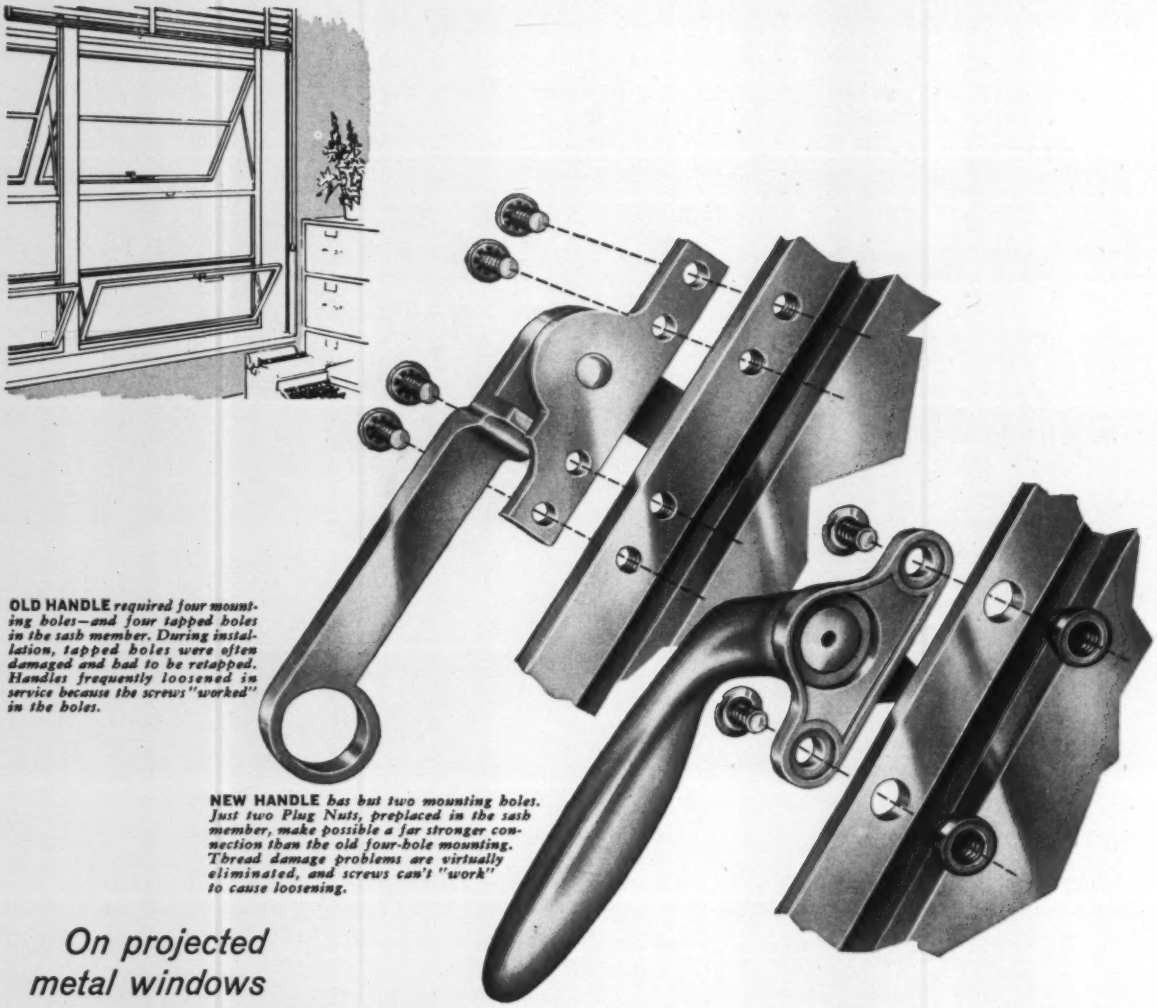
If you have a forgings problem, Bethlehem is a good company to get in touch with. We think as hard about one-pound drop forgings, as we do about 200-ton press forgings. To start us thinking about your forging, call the Bethlehem sales office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

Steel — For strength . . . economy . . . versatility

BETHLEHEM STEEL

BETHLEHEM STEEL



OLD HANDLE *required four mounting holes—and four tapped holes in the sash member. During installation, tapped holes were often damaged and had to be retapped. Handles frequently loosened in service because the screws "worked" in the holes.*

NEW HANDLE *has but two mounting holes. Just two Plug Nuts, preplaced in the sash member, make possible a far stronger connection than the old four-hole mounting. Thread damage problems are virtually eliminated, and screws can't "work" to cause loosening.*

On projected metal windows

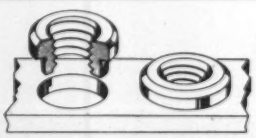
Plug Nuts cut installation costs... permit improved handle design

Using Plug Nuts to fasten window handles, a leading window manufacturer was able to: (1) improve handle design; (2) reduce installation cost; (3) eliminate handle loosening.

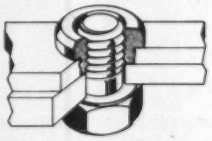
Plug Nuts are hardened, threaded inserts designed to be pressed into ductile material. Once inserted, the Plug Nut becomes a self-clinching, pre-placed nut—improving fastenability of thin or soft materials, such as steel, brass and aluminum. Plug Nuts are ideal for blind or hard-to-reach locations, and do not affect flatness of product material.

Plug Nuts are made for use in any thickness of material down to .030" and in any tap size from #4 to ¾". You can order Plug Nuts in case hardened steel, brass, various grades of stainless and aluminum in a full range of finishes. *Write for samples and complete application data.* Call your Lamson Distributor for immediate service on standard fasteners.

Distributors: Franchises for the sale of Plug Nuts are available in selected territories.



Plug Nut is easily inserted with hand punch or small press. Displaced hole material flows into knurls and annular groove, to clinch nut securely in place. Note that Plug Nut does not project through material.



Plug Nut's low profile head is a real advantage where clearance is tight.

LAMSON & SESSIONS

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YOUR MOST OVERPAID OPERATOR

Are you *sure* you are making full use of the manpower and the machine productivity you are paying for? Are you handicapping your operator—tying him to inefficient, obsolete equipment? You may be doing just that, even though your equipment is just ten years old—for the average ten-year-old is only 60% as efficient as its 1960 successor.

AUTOMATIC LATHES CUT COSTS

With increased competition and rising costs, increased production efficiency is vital if profit levels are to be maintained. More and more plants are turning to the advantages of automatic lathes.

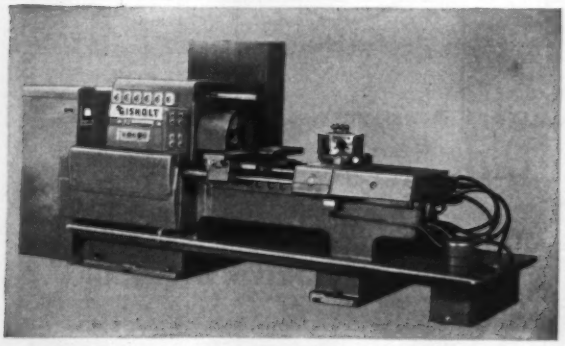
Lower costs, less dependence on operator skill, faster production on a wide variety of jobs—these are just a few of the many benefits offered by the Gisholt family of automatic lathes.

BOOST OPERATOR PRODUCTIVITY

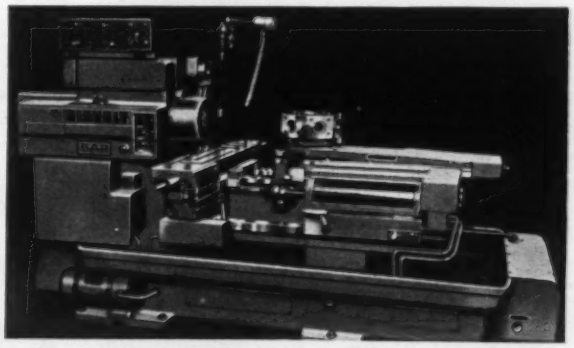
These new Gisholts handle intricate machining steps in rapid sequence—automatically—allowing your operators to handle two or more machines without extra effort.

Get all the facts now—call your Gisholt Representative or write for literature on the Gisholt machines shown—the Fastermatic with new FeeDial® control and the AR Turret Lathe.

Gisholt MASTERLINE FASTERMATIC®
Automatic Chucking Turret Lathe



Gisholt MASTERLINE AR®
Automatic Ram Turret Lathe



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We Introduce Our April Winner

Acting on behalf of STEEL, E. O. Waters (left) production control manager, Porter-Cable Machine Co., Syracuse, N. Y., awarded a $500 Usership check to winner Frank Terrio, purchasing agent for the company.

Here's What Mr. Terrio Wrote

"The structural adhesives advertisement in the Apr. 25 issue of STEEL (p. 43) by Minnesota Mining & Mfg. Co., St. Paul, attracted us greatly. We manufacture portable electric tools. Among our products are wood routers. We also manufacture steel and carbide tipped router bits and cutters. We have had many problems with the carbide tipped cutters because of design and difficulty in brazing tips to shanks.

"We have contacted 3M and obtained samples of their epoxy resin adhesive with which we hope to bond carbide tips to shanks.

"One current difficulty: Alloy steel (which we are using as shank steel) distorts when it reaches brazing flow temperature. Theoretically, the steel should not distort at that temperature. Unfortunately, it is almost impossible to control the heat accurately enough to prevent distortion. On many of our carbide cutters and router tips, we have had to go to high speed steel which costs $1.65 per pound vs. an average of 18 cents per pound for alloy steel.

"We hope the adhesive will eliminate using high speed tool steels which merely act as holders or shanks for the carbide tips. We will return to using the alloy steel, glue components, and have a satisfactory part. One bit has passed most of our tests. We found that the cutter broke before the tip came off the shank.

"We also expect to save a considerable amount of money in the gluing operation vs. the ticklish, time consuming, brazing operation. If successful, and if we were forced to estimate, we would say that a $30,000 annual saving is possible. Because of many contingencies, this is a long range project . . . however, we hope to report favorably to you within the next few months."

Honorable Mention Winners . . .

. . . were awarded engraved desk lighters. The eight: H. R. Ball, manager-production programing, Laundry Group, Whirlpool Corp., St. Joseph, Mich.; Inmon V. Hale, tool engineer, Hartzell Propeller Inc., Piqua, Ohio; Richard J. Kutz, tool specialist, Medium Voltage Mfg. Engineering, General Electric Co., Philadelphia; J. P. Lencioni, superintendent, Cold Roll Mill, Fontana Works, Kaiser Steel Corp., Fontana, Calif.; Howard G. Lord, Engineering Dept., Heltzel Steel Form & Iron Co., Warren, Ohio; K. J. Pattow, director-industrial relations, James Mfg. Co., Ft. Atkinson, Wis.; Jack Ratkovic, industrial salesman, Texaco Inc., Chicago; Alexander Schelkun, chief draftsman, Drafting Dept., Wheel & Brake Plant, B. F. Goodrich Aviation Products Div., B. F. Goodrich Co., Troy, Ohio.

You Can Win $1000 This Month . . .

. . . in STEEL's Usership Idea of the Month Contest. Tell us, in 300 words or less, how you plan to USE an article or advertisement in this issue (or any other issue published this month—June, 1960) to help you accomplish an important personal or company objective. Be as specific as you can. If, in the opinion of the judges, yours is the best idea submitted—**you will win $500.**

There's more . . . You will win an additional $500 if you furnish written proof that you accomplished your objective. Proof must be submitted

I believe _____ automobiles will be produced in the U. S. from Jan. 1 through Dec. 31, 1960.

Mail this to:

Ed Service
Beat-the-Experts
STEEL
1213 W. 3rd St.
Cleveland 13,
Ohio

PRINT NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

Entries must be postmarked before midnight, June 30.

within six months after you are declared winner of STEEL's Usership Idea of the Month Award.

Please identify your letters as Usership entries. They will be judged by a committee of STEEL's editors. All letters become STEEL's property.

You can enter as many times as you wish. Send your entries to me, Ed Service, Servicenter, STEEL, 1213 W. Third St., Cleveland 13, Ohio. **Deadline for this month's contest is Aug. 1.**

'Underwater Lightning'

Chicago Resident Editor Austin Brant hangs that tag on an experimental, high energy rate, forming technique that is creating quite a shock wave among fabricators of aircraft and missile parts. (The name also offers an appropriate handle for an article you'll be reading next week, in our Fourth of July issue.)

The technique, more properly known as hydrospark forming, has most of the advantages of explosive forming without some of the disadvantages.

It consists of releasing a spark of electricity in a liquid. Theorists say the spark heats the liquid, usually water, to produce a rapidly expanding gas. The resultant high pressure is almost entirely transmitted to a shock wave which bangs the metal into a die.

Read about this low cost, highly accurate process next week. The editors think it might offer another attack on the producibility barrier.

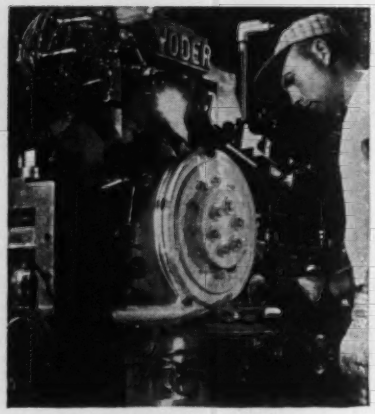
A Slow Boat to Argentina . . .

. . . could have caused the following request, dated May 28, 1960: "Just yesterday, I had on my desk your offer of a pretty scale model car. It goes to people who guesstimate correctly the number of cars that will be produced in the U. S. during 1959. Would you send a model to me?"

The inquirer, chief of a structural shop in Buenos Aires, sent along a Beat-the-Experts coupon clipped from our June 8, 1959, issue. The best we could do was to send him a picture of the model car.

Maybe we should have inserted the year 1959 on our deadline notice. Anyhow, if your're reading this on June 27, you have four more days to send us your estimate of U. S. passenger car production for calendar 1960. The rewards: Any Ford Div. car of your choice to use as your own for two full weeks (if you're the best guesser). Full color prints of a snappy dream car, rendered by Virgil M. Exner, Chrysler Corp. vice president and director of styling, are the prizes for the five next best guessers.

Tear, clip, or cut the coupon in this department. Enter your estimate and mail it today.



Yoder Tube Mills speed tailpipe production at AP Parts Corporation

The AP Parts Corporation (Toledo, Ohio), world's largest producer of replacement mufflers and tailpipes, uses 2 YODER Tube Mills to produce more than *300* ft. of 1¾", 1⅞" and 2" tubing per minute.

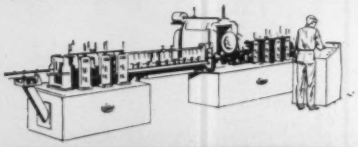
According to Mr. John Grindle, Plant Engineer, the two-man operated YODER Mills are vital to the production of the entire plant. "YODER Tube Mills earn their keep daily. They are easy to set up, maintain and operate ... the welds are clean and uniform. We depend on them for constant quality, high production and minimum downtime".

The YODER Tube Mills at AP Parts exemplify the production economies and dependability of all YODER-built equipment, whether it be Pipe and Tube Mills, Cold Roll-Forming Machinery or Slitting Equipment.

If your products require ferrous or non-ferrous pipe or tubing, from ¼" to 26" diameters, there is a YODER Mill designed to produce it economically, accurately and efficiently.

For complete information on YODER Pipe or Tube Mills ... write for the fully illustrated, 88 page YODER Tube Mill Book ... it is yours for the asking.

THE YODER COMPANY
5502 Walworth Avenue • Cleveland 1, Ohio



ENGINEERING YODER MANUFACTURING
PIPE AND TUBE MILLS
(ferrous or non-ferrous)

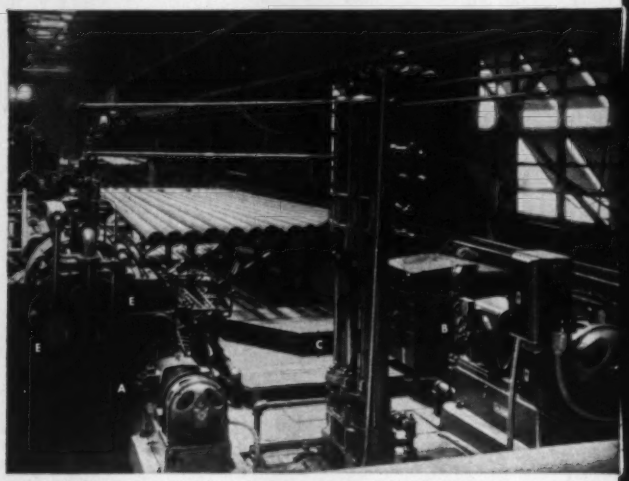
Fluid Power news

REPORT NO. 11,803 TEST MORE PIPE—LONGER WITH OILGEAR

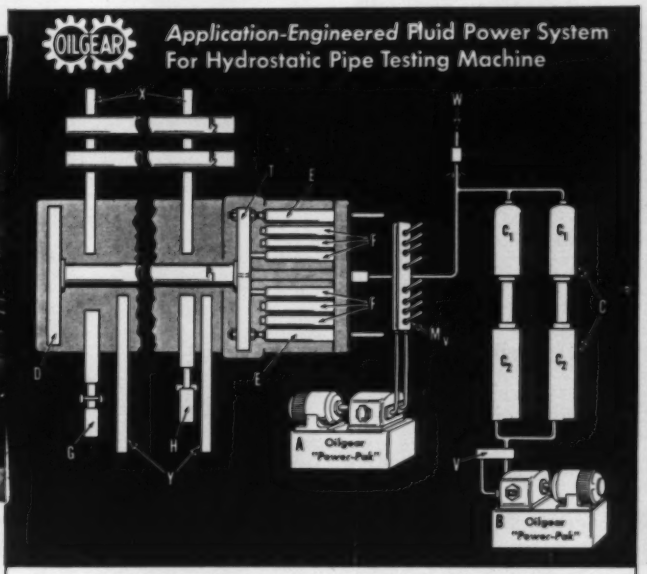
From Oilgear *Application-Engineering* Files

HOW OILGEAR SYSTEM POWERS PIPE TESTER EFFICIENTLY AFTER 23 TROUBLE-FREE YEARS

DATA: To supply power and control system for five functions of a hydrostatic pipe testing machine designed for a wide variety of pipe sizes and testing pressures ranging up to 6000 psi. Linear drives and controls were needed to: *1.* Actuate jaw-type clamps to hold and prevent pipe from buckling. *2.* Traverse testing head rapidly to and from testing position. *3.* Hold testing head against pipe under testing pressures. *4.* Actuate "knockout" arms to eject tested pipe from machine. *5.* Actuate an intensifier to boost water used for testing from city pressure to any selected testing pressure up to 6000 psi. *Specific Operating Requirements:* Simple, safe, dependable; capable of continuous, 'round-the-clock operation, 6 days per week in highly humid atmosphere; cycle rapidly for economical production; require a minimum of maintenance to prevent costly, line-stopping downtime; must be compact to conserve valuable floor space, economical in the use of electrical power.



Hydrostatic Pipe Tester with *Oilgear Application-Engineered Fluid Power System* as installed in 1937, and operating continuously since that time. Oilgear "Power-Paks" (A,B), Intensifier (C), Rapid Traverse Testing Head Cylinders (E) are indicated by arrows. Manifold and Control Valves at operator's station (M_V in drawing) are clearly visible, as are the direct-reading, operating pressure gages on the "Power-Paks." Testing pressures are quickly preset with a small handwheel on "Power-Pak" (B)—not visible. Pipe to be tested rolls directly from pre-testing storage racks, at right, directly into the machine.



HOW IT WORKS: Pipe to be tested (P_2) rolls from storage rack (X) into cradle of machine between Testing Head (T) and Tail Carriage (D). Testing Head (T) is moved forward quickly by Double-Acting Cylinders (E). Clamping Jaws actuated by Cylinder (G) grip the pipe along its length to prevent buckling. Pipe (P_1) is pre-filled with water at city pressure (W). Single-Acting Test Head Holding Cylinders (F) move up in matching pairs—2, 4, 6, 8, 10, or all 12 can be selected—depending on pipe size and testing pressure to hold Testing Head (T) against Pipe (P_1) and Tail Carriage (D). Movement of cylinders (E, F, G, H) are all controlled by valves mounted on Manifold (M_V) which direct fluid flow from Oilgear "Power-Pak" (A). Water at preselected test pressure from Intensifier (C) then exerts pressure on Pipe (P_1). Oilgear "Power-Pak" (B) supplies *Fluid Power* through Valve (V) to actuate Hydraulic Intensifier Cylinders (C_2) increasing pressure in Water Cylinders (C_1) to any desired pressure up to 6000 psi. After pipe is inspected, intensifier pressure is released, Testing Head (T) is rapidly retracted, and Knockout Cylinder (H) actuates mechanism to eject tested pipe onto rack (Y). Machine is then ready to start a new test cycle.

SOLUTION: An *Oilgear Application-Engineered System* consisting of two Oilgear Heavy-Duty "*Power-Paks*," Directional Control Valves, and "Custom-Quality" Cylinders. Each "*Power-Pak*" uses an Oilgear Heavy-Duty One-Way Variable Displacement Radial Rolling Piston Pump with automatic pressure unloading control to reduce pump stroke when holding a preset pressure indefinitely; eliminate excessive heating and power loss; reduce electrical power input requirements. Oilgear Pumps contain integral auxiliary systems for pilot, supercharge, cooling and filtering . . . with constant pressure and flood self-lubrication, conservatively loaded anti-friction bearings, and large internal passages—mechanical and hydraulic friction is reduced to a minimum for high efficiency . . . virtually guaranteeing a long, trouble-free, maintenance-free life.

USER REPORTED IN 1938—"*. . . after one year of operation we have nothing but the highest praise for the Oilgear Equipment on this pipe tester.*"

USER REPORTS IN 1960—"*This machine has given us years of trouble-free service, operating around the clock six days a week . . . maintenance has been at a minimum, with occasional changes in intensifier packings, as would be expected in normal operation . . . performance has been completely satisfactory.*"

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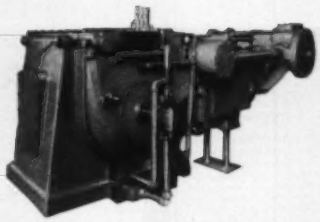
Dann Goodson, *Manager Motor-Driven Compressor Sales, The Cooper-Bessemer Corporation, explains...*

How National Tube steps up production

Lorain Works of National Tube Division, United States Steel Corporation, is increasing ingot output by injection of oxygen into open hearth furnaces. Introduced by lances extending through the roof down into the furnace, the oxygen speeds up production. It is fed directly into the metal in a volume of 28,000 cu. ft. per hour per furnace.

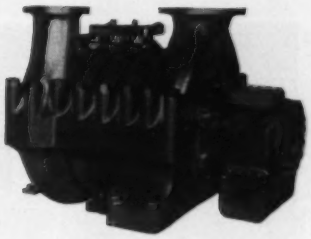
Another major use of oxygen at the Lorain Works is for hot bloom scarfing. The machine shown here removes seams and other defects, conditions blooms for rolling into top quality products. Entire operation is automatic, push-button controlled.

The 2000 hp Cooper-Bessemer Type JM Air Compressor, shown here, plays an important part in the manufacture of the oxygen used for these and other operations at the Lorain Works. This is a 4-stage unit,

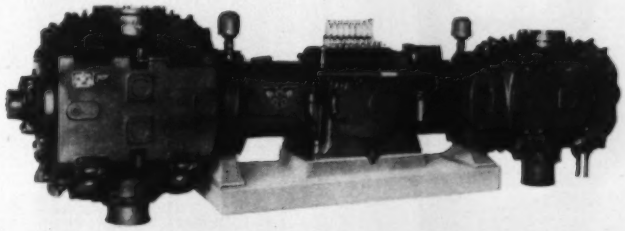


EXPANSION ENGINES

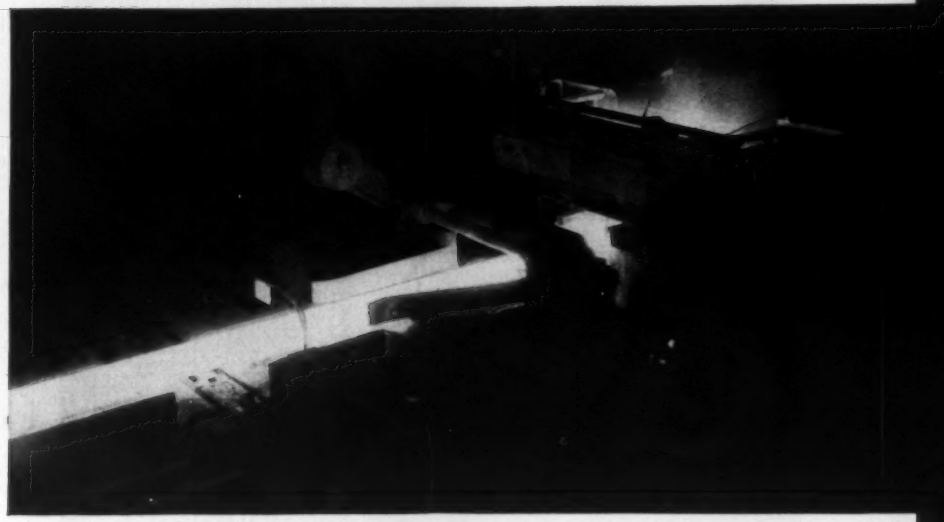
Cooper-Bessemer products for oxygen production include reciprocating and centrifugal compressors, expansion engines and En-Tronic controls.



CENTRIFUGAL COMPRESSORS



RECIPROCATING COMPRESSORS



Hot scarfing machine at Lorain Works steps up deseaming speed, boosts uniformity of this conditioning process.

with oxygen

operating at 300 rpm with a discharge pressure of 1000 lbs. The plant was designed and built by American Messer Corporation.

Cooper-Bessemer can supply all types and sizes of reciprocating or centrifugal compressors, expansion engines and En-Tronic® controls for oxygen production. Call our nearest office for engineering service when you start to plan your facilities.

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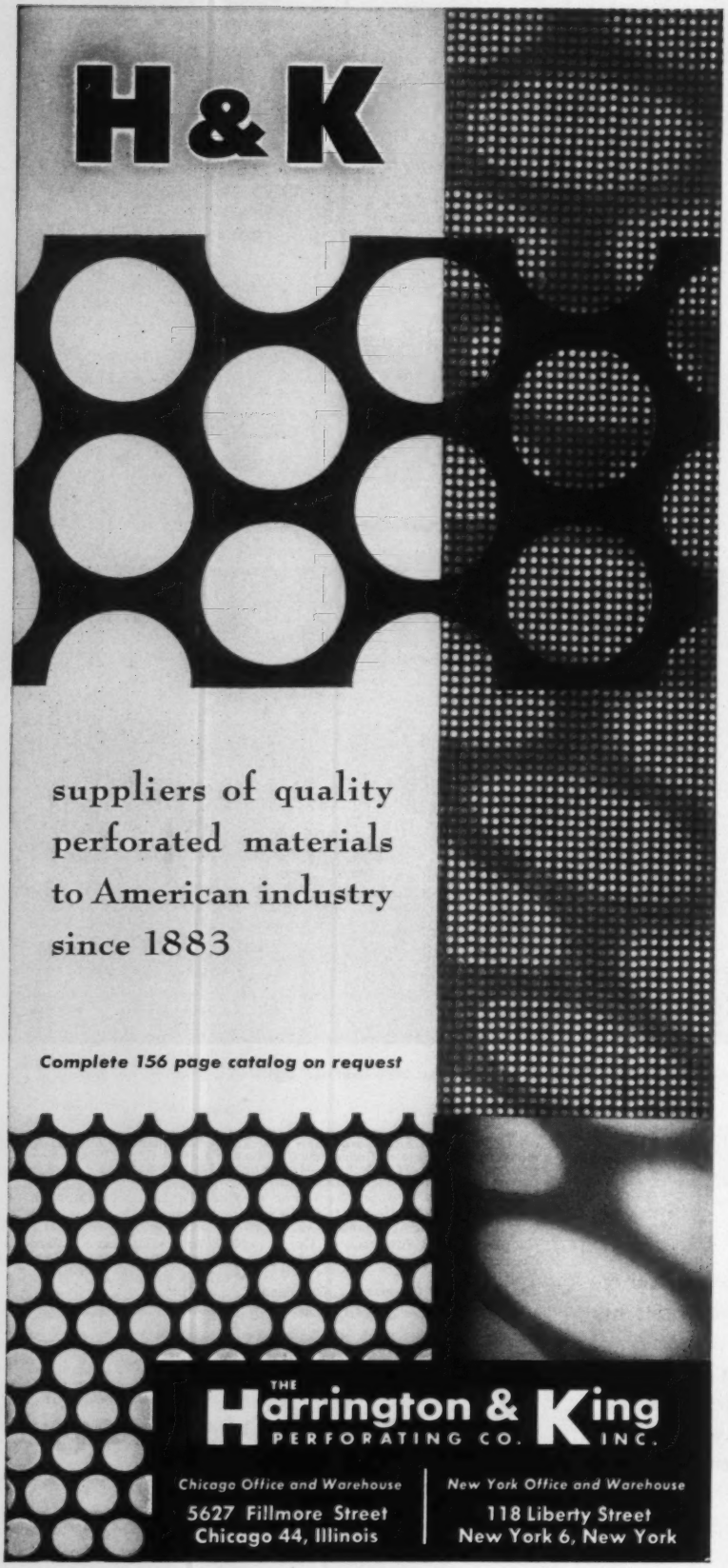
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OF MEETINGS

July 2-6, National Tool & Die Manufacturers Association: Summer meeting, Banff Springs Hotel, Banff, Alta. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

July 10-13, Truck-Trailer Manufacturers Association: Summer meeting, Homestead Hotel, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

July 11-12, Metallurgical Society of AIME: Conference on response of materials to high velocity deformation, Estes Park, Colo. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary R. W. Shearman.

July 22-24, National Association of Metal Finishers: Annual meeting, Statler-Hilton Hotel, Los Angeles. Association's address: 60 Bently Rd., Cedar Grove, N. J. Executive director: P. Peter Kovatis.

July 24-28, American Electroplaters Society: Annual meeting. Statler-Hilton Hotel, Los Angeles. Society's address: 445 Broad St., Newark 2, N. J. Executive secretary: John P. Nichols.

Aug. 8-12, American Institute of Electrical Engineers: Pacific general meeting, U. S. Grant Hotel, San Diego, Calif. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Aug. 15-17, American Society of Mechanical Engineers and American Institute of Chemical Engineers: Heat transfer conference and exhibit, Statler-Hilton Hotel, Buffalo. Information: ASME 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Aug. 16-19, Society of Automotive Engineers Inc.: National West Coast meeting, Jack Tar Hotel. San Francisco. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 3-4, American Machine Tool Distributors Association: Annual meeting, LaSalle Hotel, Chicago. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelley.

Sept. 6-16, National Machine Tool Builders Association: The Machine Tool Exposition—1960, International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

Sept. 6-16, Production Engineering Show: Navy Pier, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

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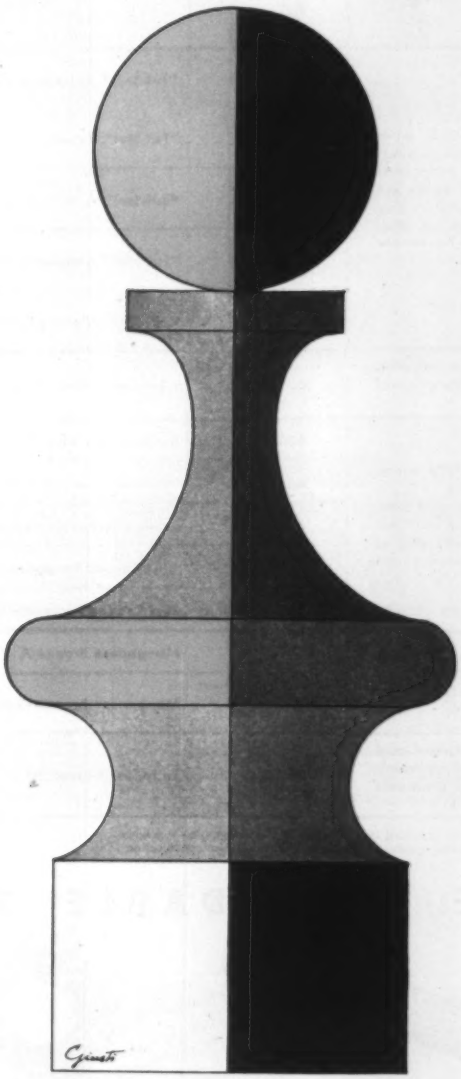

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	224E-75	"Tuf-Stuf" Aluminum Bronze	BRINELL 1000 KG load 175
	224C	"Tuf-Stuf" Aluminum Bronze	BRINELL 1000 KG load 185
	224H	"Tuf-Stuf" Aluminum Bronze	BRINELL 1000 KG load 200
	224K	"Tuf-Stuf" Nickel Aluminum Bronze	BRINELL 3000 KG load 250
ALUMINUM SILICON BRONZE is free turning; has high strength, is corrosion resistant and non-magnetic and resistant to corrosion cracking under load.	802	Aluminum Silicon Bronze	ROCKWELL-B 75
600 SERIES® FORGEABLE BEARING ALLOYS range from high strength to low leaded ductile. All are corrosion resistant, free cutting, can be used with hard or soft mating members and can be soldered. They are employed in a great variety of applications ranging from pump gears and valve stems to pinion shafts and transmission rings.	600	Forgeable Bearing Alloy	ROCKWELL-B 88
	601	Forgeable Bearing Alloy	ROCKWELL-B 87
	602	Leaded Forgeable Bearing Alloy	ROCKWELL-B 87
	604	High Leaded Forgeable Bearing Alloy	ROCKWELL-B 86
	605	Low Leaded Forgeable Bearing Alloy	ROCKWELL-B 80
MANGANESE BRONZE ALLOYS are exceptionally strong, tough, resistant to shock and corrosion. Good for screw machine products and forgings for aircraft parts.	241A	Manganese Bronze A	ROCKWELL-B 85
	721	Manganese Bronze High Tensile Grade B	BRINELL 1000 KG load 200
TELLURIUM COPPER has very high electrical and thermal conductivity combined with good corrosion resistance and machinability. Excellent for electronic components.	799	Tellurium Copper	ROCKWELL-B 45

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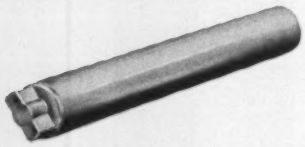

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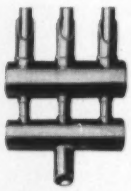

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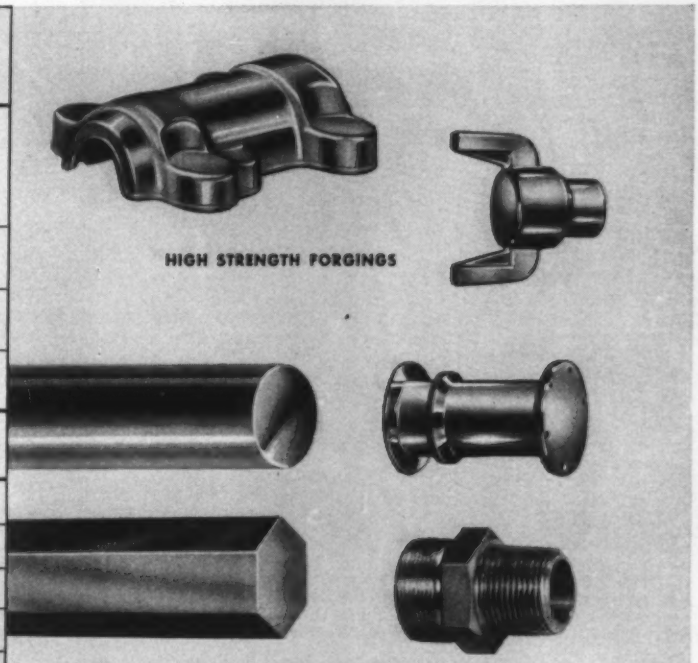
70,000	90,000	30
65,000	105,000	20
35,000	85,000	60
60,000	90,000	25
55,000	78,000	35
65,000	85,000	65
55,000	75,000	80
45,000	70,000	55
55,000	78,000	25
68,000	115,000	35
40,000	43,000	90



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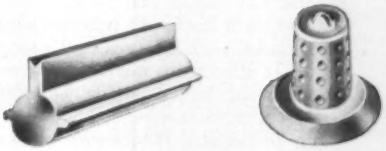

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. . . **Stacks of Nestaway racks** show nesting, interlocking and space-saving features of racks for baked goods handling made by Mid-West Metallic Products for its affiliate, Nestaway, Inc. Rack held by Harold W. Vetter (left), Mid-West director of manufacturing, and Robert J. Adams, purchasing agent, holds 12 loaves of bread and stacks 12 high on castered base. Rack uses up to 13.3 pounds of Pittsburgh Steel Co.'s bright basic wire.

DELIVERING BREAD—BY WIRE

Pittsburgh Steel wire's uniform welding, forming properties give Mid-West Metallic extraordinary success in the manufacture of Nestaway racks

Bread and pastries are delivered better by wire. That is, by welded steel wire racks that perform double duty in handling and selling baked goods.

Mid-West Metallic Products, Inc., a fast-growing subsidiary of Rubbermaid, Inc., uses Pittsburgh Steel Company's bright basic wire to build wire shipping racks for its affiliate, Nestaway, Inc., another Rubbermaid subsidiary. In addition to the Nestaway racks, Mid-West makes more than 300 other wire formed products, using Pittsburgh Steel's bright basic and galvanized wire in a wide range of sizes.

The Nestaway racks, however, are a prime example of Mid-West's experience in using Pittsburgh Steel's .3625 and .3065 bright basic wire.

The racks are part of a complete Nestaway system for baked goods handling to and at the point of sale. The system includes interlocking wire racks, rack shelves and caster bases. It eliminates nearly all direct handling of baked goods between bakery and consumer.

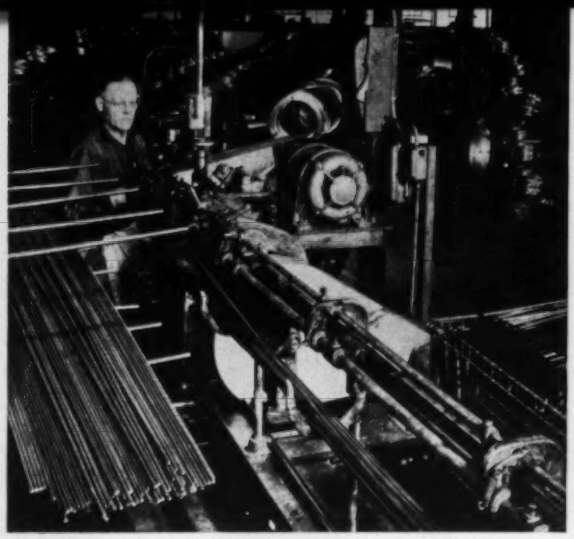
To build the Nestaway racks, Mid-West uses automated and semi-automated forming and welding equipment of its own design. This equipment requires wire with the highest possible uniform physical properties. Mid-West depends on Pittsburgh Steel for much of its wire supply because it is assured consistent, uniform quality.

• **Phenomenal Welding Success**—Made in 11 sizes ranging from 8.4 to 13.3 pounds in weight, an average Nestaway rack requires 200 welds.

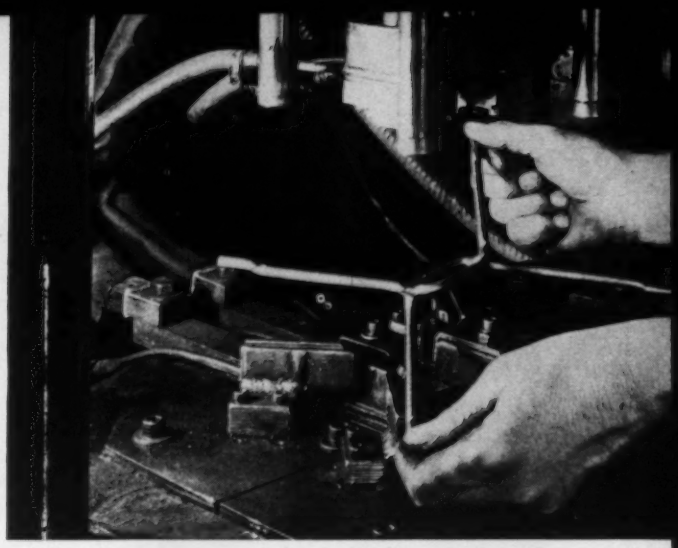
On welding, Harold W. Vetter, Mid-West's director of manufacturing, says:

"In all of our production last year, we had an extraordinarily low number of broken welds. We've had racks returned that had been accidentally crushed by trucks—but the welds were seldom broken."

Purchasing Agent Robert J. Adams adds further evidence of the



. . . **From straightening and cutting** through final copper-nickel-hard chrome plating, Pittsburgh Steel's wire meets Mid-West Metallic's requirements for consistent uniformity of forming, welding, coating properties.



. . . **Key piece of rugged Nestaway rack**—the bends and welds on "X"-shaped side supports are produced to tolerances of plus/minus .015 inch by Mid-West Metallic with Pittsburgh Steel's .3625 bright basic wire.

weldability of Pittsburgh Steel's bright basic wire, saying:

"We found Pittsburgh Steel wire would consistently hold welds when we bend the welded ends of the rack's bottom frame to form Nestaway's interlocking feature."

• **Close Forming Tolerances**—Because Nestaway racks are built to stack when loaded and nest precisely when empty, wire bends are made to unusually close tolerances. Mr. Vetter explains:

"This rack is so accurately formed that it's practically a machined product. Every bend—even over-all dimensions and some welds—is held to a tolerance of .015 inch."

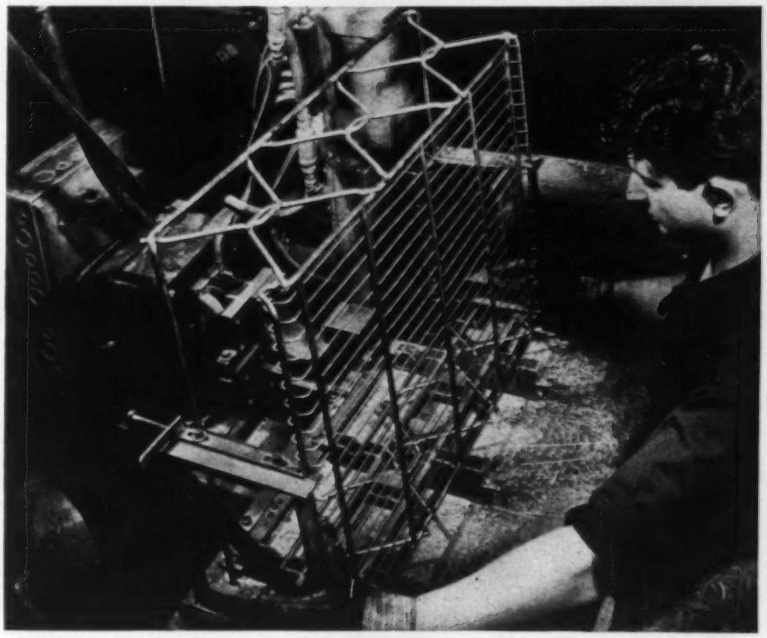
Surface finish of Pittsburgh Steel's wire is vital, too. After assembly, the rack is given a copper-nickel-hard chrome coating to provide a durable, attractive unit which meets strict standards of cleanliness.

Pittsburgh Steel's ability to supply wire with the consistent quality Mid-West Metallic requires is testified to by Purchasing Agent Adams. He says:

"Pittsburgh Steel furnishes us quality wire with uniform properties from shipment to shipment. Otherwise, we're in trouble on our automatic machines. We want wire that is weldable, formable and clean.

"Pittsburgh Steel has been able to give us what we want with consistency and we're extremely satisfied with the way its wire performs for us."

Take a lesson from Mid-West Metallic's experience. The benefits this progressive company gets from using Pittsburgh Steel's wire can be yours, too, whatever your application. Just contact one of the district offices listed at the right.



. . . **With 200 welds per rack** and a present capacity of more than 25,000 Nestaway racks per month plus component parts of the Nestaway System, Mid-West Metallic experiences very few broken welds in the course of a year. Credit goes to efficient equipment and wire quality. Nestaway rack is shown here in assembly before chrome plating. Mid-West, a subsidiary of Rubbermaid, Inc., looks to Pittsburgh Steel for bright basic wire and plain galvanized wire to make Nestaway racks and more than 300 other products at the new Cleveland, Ohio, plant.

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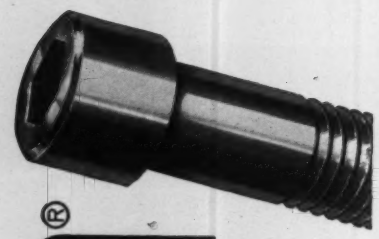

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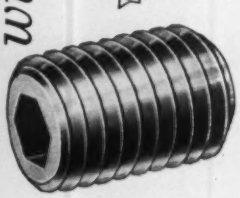

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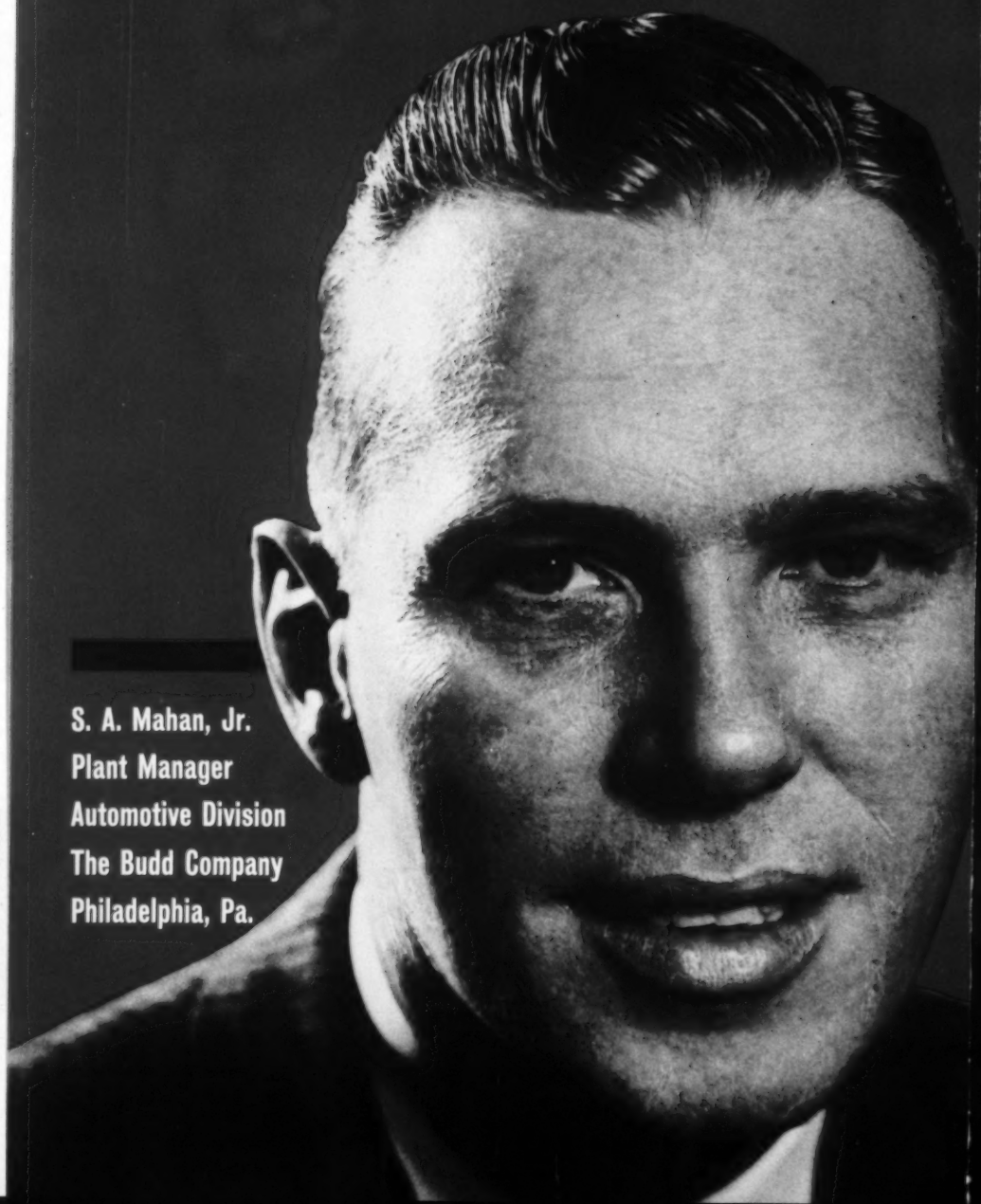
"OUR FIRST TAPE-CONTROLLED MACHINE TOOL HIGHLY SUCCESSFUL

. . . A REAL BREAK-THROUGH IN MANUFACTURING EFFICIENCY."



S. A. Mahan, Jr.
Plant Manager
Automotive Division
The Budd Company
Philadelphia, Pa.

GIDDINGS & LEWIS

ECONOMIC BENEFITS OF NUMERIPOINT* CONTROL AT THE BUDD COMPANY

The management of The Budd Company realized that tape-controlled machining in specific applications would be a means of improving service to customers and reducing manufacturing costs at the same time. As a result, a Giddings & Lewis Numeripoint-controlled horizontal was purchased for drilling, boring, reaming, and tapping die blank holder castings and plates.

The Budd Company — a major su
automobile components, maintainin
in Philadelphia, Gary, and Detroit
one of the nation's leading die, jig, an
builders for the automotive, aircr
missile industries. In this tool busin
time, scheduling, cost, and accu
critical factors.

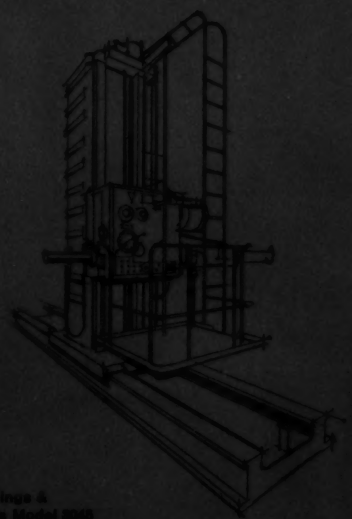
The G&L machine has met the
ments beautifully. Here is how S. A
Jr., plant manager, sums up the ben
rived from it: "Our Giddings & Lewis
point-controlled machine has been
successful — has improved accur
saved money, reduced lead time, an
us to meet tight schedules. We feel
machine is just a start — that it has
the foundation to go further into Num
controlled machines."

● Here are some of the reasons bel
Mahan's statement as summed up by
purchasing, shop, and programming p

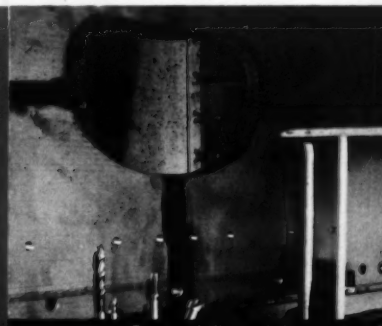
*Giddings & Lewis trade name

G&L Numeripoint control is management control . . .

All the machining on a part is programmed by the process technician who "lays out" the piece by means of a written manuscript, establishes sequence of operations, and machine feeds and speeds. His written manuscript is typed out on a Flex-o-writer which punches the tape which operates the machine. Production rates and accuracies are predetermined.

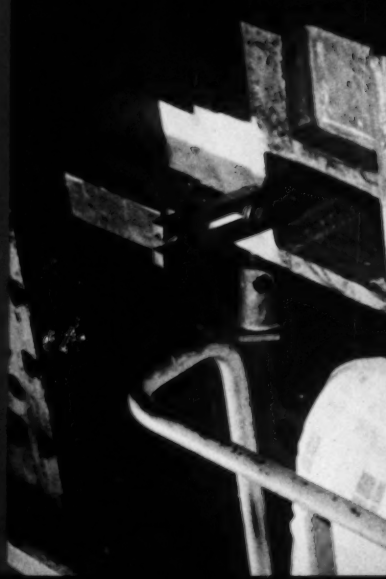


Giddings & Lewis Model 8048 floor-type horizontal boring, drilling, and milling machine used at The Budd Company.



Center drilling, drilling, chamf
and plates are accurate on ce

Below — The operator has co
He needs do no physical chec



GIDDINGS & LEWIS

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as provided
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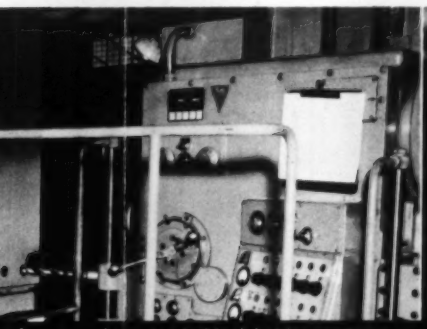
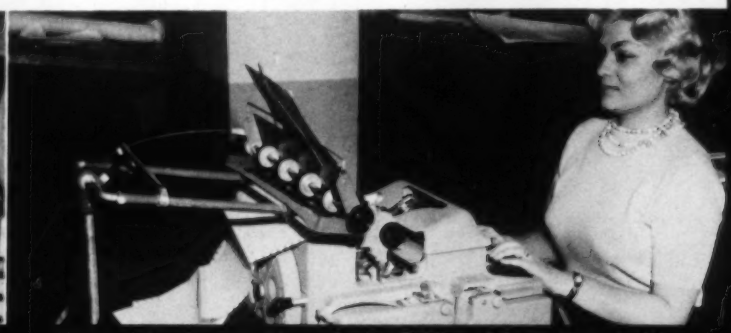
ehind Mr.
by Budd's
personnel:

- Some jobs that formerly took 29 hours on another type of machine, plus ten hours in layout, now require only 20 hours totally on the G&L machine.
- Expensive layout work and checking of layout are completely eliminated. The need for a crane and riggers to set up work on layout tables also is eliminated.
- Because die blank holder castings and plates now are accurately machined to ± .001″ to tolerance from the same tape, parts go together smoothly on the assembly floor with consequent time savings and elimination of reworking.
- It used to take as long to make costly fixtures for some parts as it now does to machine the entire part itself.
- After only three months' experience, the programmer can "tape" a part in a fraction of the time previously required to lay it out.
- Work can be planned more efficiently because programming is done well in advance of production.
- Workpieces with many common operations or hole patterns can share a master tape — only the differences need to be programmed individually.
- Once programmed, work can be accurately duplicated any time, with any machine operator, and with no lead time for layout involved.
- Each tool is handled only once; fast positioning permits all identical operations to be performed before changing tools.

The benefits that The Budd Company has secured are typical of those being experienced wherever G&L tape-controlled machines are in use. For a complete analysis of what this equipment might do for you, consult your local G&L distributor or write for information.

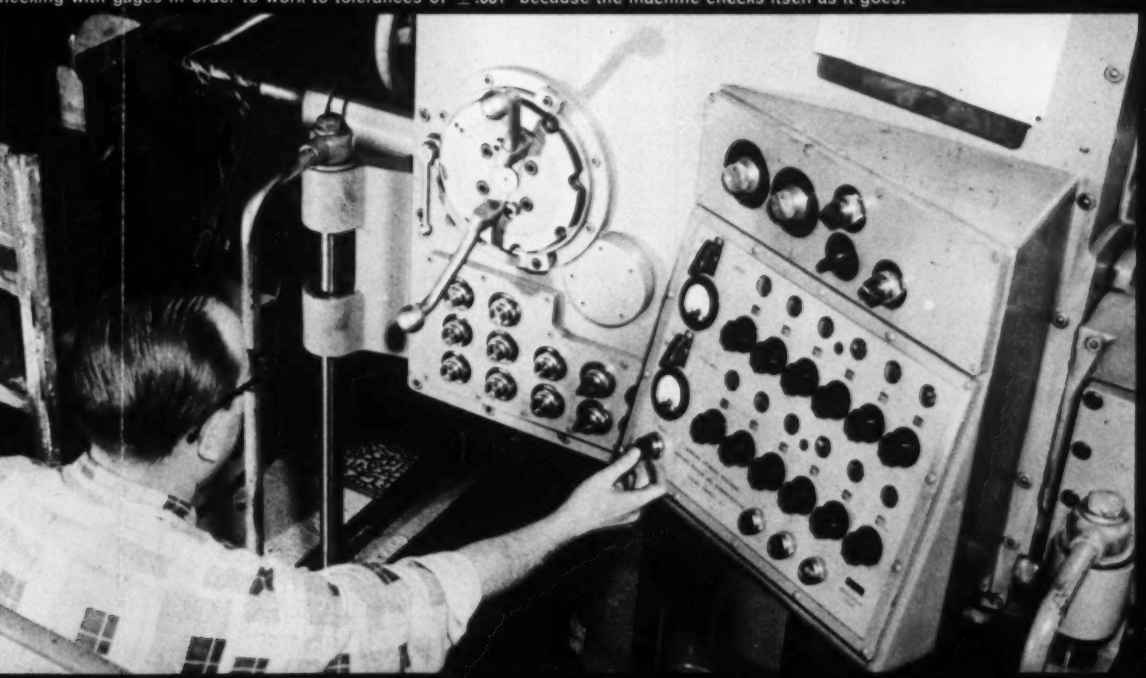


mfering, and tapping in blank holder castings
center lines within ± .001″ from end to end.



Manuscript and punched tapes for the Giddings & Lewis Numeripoint-controlled machine are easily produced on a Flex-o-writer.

complete supervision of the machine through the control system — the readout system tells him the exact position of his tool.
hecking with gages in order to work to tolerances of ± .001″ because the machine checks itself as it goes.



FIRST tape-controlled contour milling machine . . . *FIRST* tape-controlled vertical boring mill . . . *FIRST* tape-controlled vertical turret lathe . . . *FIRST* tape-controlled die sinking machine . . . *FIRST* tape-controlled horizontal boring, drilling, and milling machine . . . *FIRST* machine tool builder to develop and manufacture its own numerical controls . . . *FIRST* and only builder to provide programming and magnetic tape preparation service for customers . . . *FIRST* builder to offer both path and point control . . . *FIRST* builder to use tape-controlled machine tools in its own shops.

EXPERIENCE
TO HELP YOU INTO TAPE

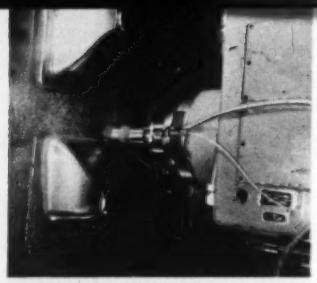
from the people who developed the first commercially available tape-controlled machine tool

The decision to go into tape depends upon a number of economic and manufacturing considerations. You can come with confidence to Giddings & Lewis to discuss these considerations.

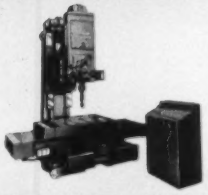
Giddings & Lewis pioneered tape-controlled machine tools . . . has produced more major machines with numerical control than any other builder . . . has developed its own control systems . . . uses tape-controlled machines extensively in its own shops . . . and has established a numerical control research, development, testing, and programming center unique in the industry.

Giddings & Lewis machine tools are available with G&L Numeripath* magnetic tape continuous-path control or G&L Numeripoint* punched tape discrete positioning control, as well as with other makes of control systems. These machines are specifically designed and manufactured to be operated under tape.

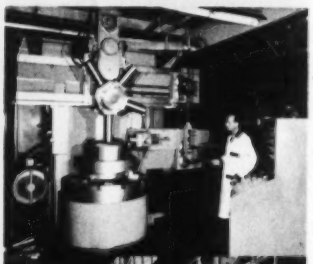
For experienced answers to your tape-control questions, consult your Giddings & Lewis distributor or the factory. Literature available upon request. *Giddings & Lewis Machine Tool Company, Fond du Lac, Wisconsin.*



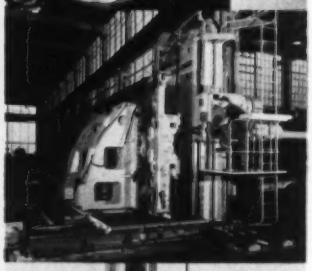
CONTOUR MILLING MACHINES



POSITIONING TABLES



VERTICAL TURRET LATHES



FLOOR-TYPE HORIZONTALS

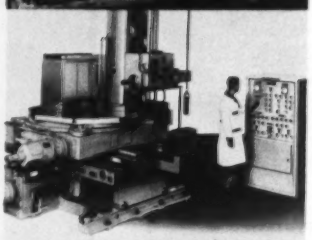


TABLE-TYPE HORIZONTALS

VERTICAL BORING MILLS

GIDDINGS & LEWIS

GIDDINGS & LEWIS

GIDDINGS & LEWIS MACHINE TOOL COMPANY, Fond du Lac, Wis.

Horizontal boring, drilling, and milling machines; vertical turret lathes; vertical boring mills; positioning tables; die sinking machines; contour milling machines; radial and upright drilling machines; planers; planer mills; numerical and tracer control systems; Davis boring tools.

*Giddings & Lewis Tradenames

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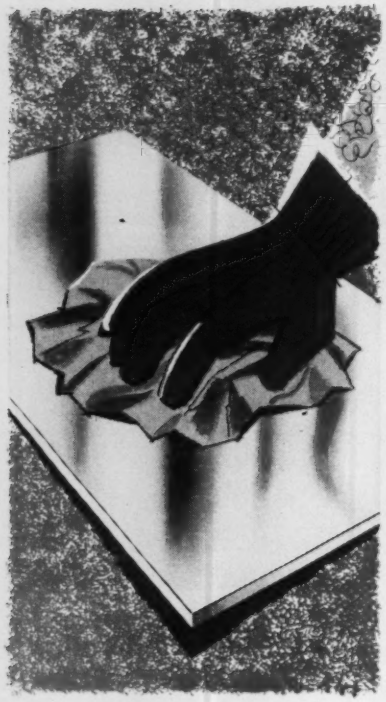
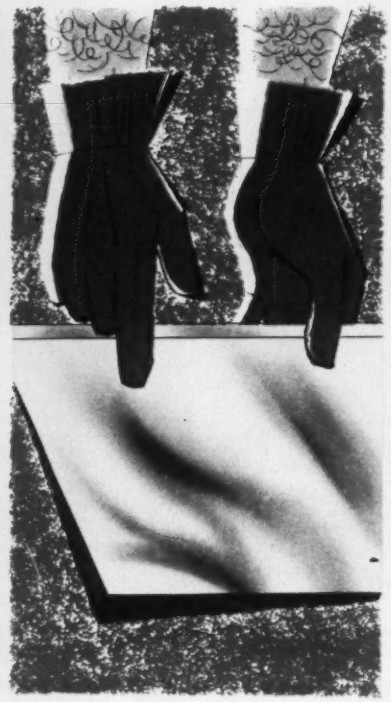
USS AMERSTRIP GIVES YOU PRECISELY



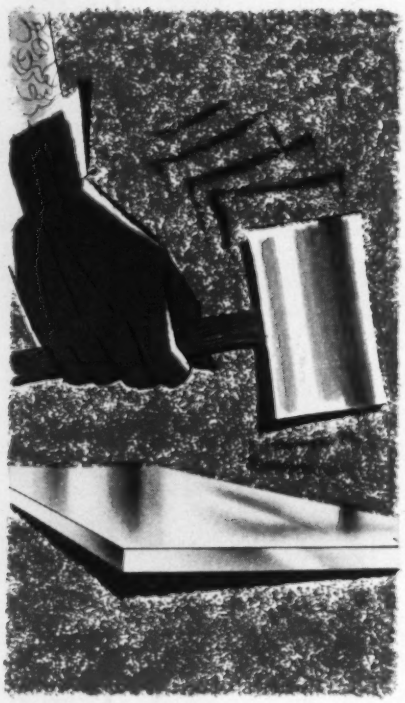
PRECISION FINISH

With USS Amerstrip we take special pains to give you a finish that is just right for the specific results you require in a finished product. We believe the Amerstrip finish is the finest you can get in the industry.



PRECISELY PREPARED EDGES

Because USS Amerstrip is produced in order-sized quantities engineered to your own specifications, we can give you precisely the edge finish you need. Choose your edge—square, standard, round, full round or bevel.



PRECISE TEMPERS

Whether your product must go through a deep draw or undergo other stringent forming operations, or if it requires a special temper for rigidity, you'll always get the correct temper for the job when you order USS Amerstrip.

WHAT YOU NEED IN A COLD ROLLED STRIP

PRECISE WIDTH TOLERANCES

When your fabricating machines require a special width strip, you can be sure that's the width you'll get with Amerstrip. We can produce USS Amerstrip within required tolerance limits to fit your special requirements.

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Whatever thickness tolerance your machines demand, you'll get it in Amerstrip. And it'll be precisely the same in every inch of Amerstrip ordered. Amerstrip can be rolled in thickness tolerances of plus or minus .0005 inches.

PRECISE UNIFORMITY

Regardless of the size of your order, every coil of USS Amerstrip comes off the line uniform in finish, temper, width and thickness. In short, USS Amerstrip's precision production assures a continuous run and high yield.

American Steel & Wire Representatives have the training and experience to give you expert guidance in fabrication and application of USS Amerstrip. They can show you how it contributes to a better finished product. To avail yourself of their services, call your nearest AS&W District Office. American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

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In REGULAR LAY ropes the wires are laid in a direction opposite to the lay of the strands. This provides stability even under severe operating conditions.

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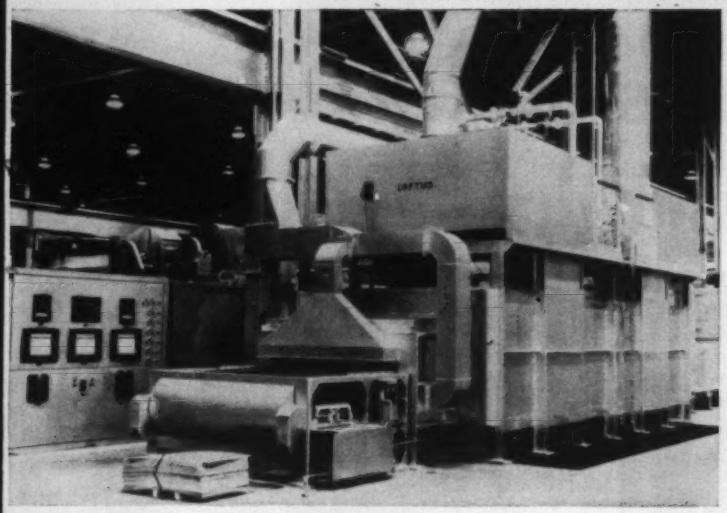

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for
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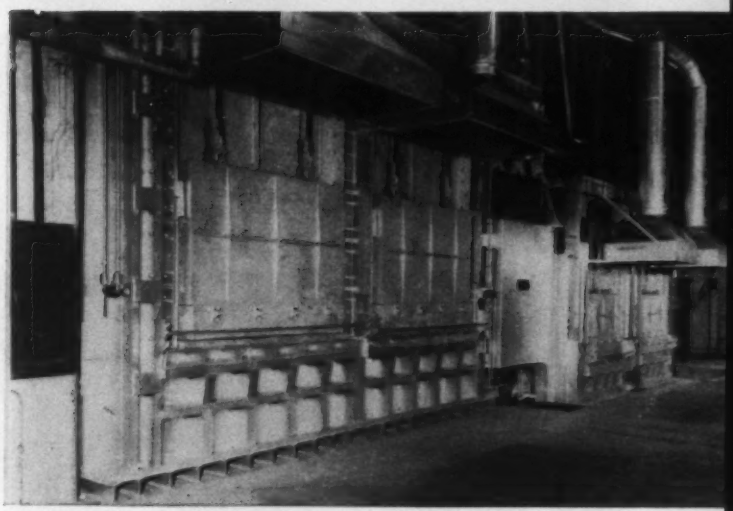
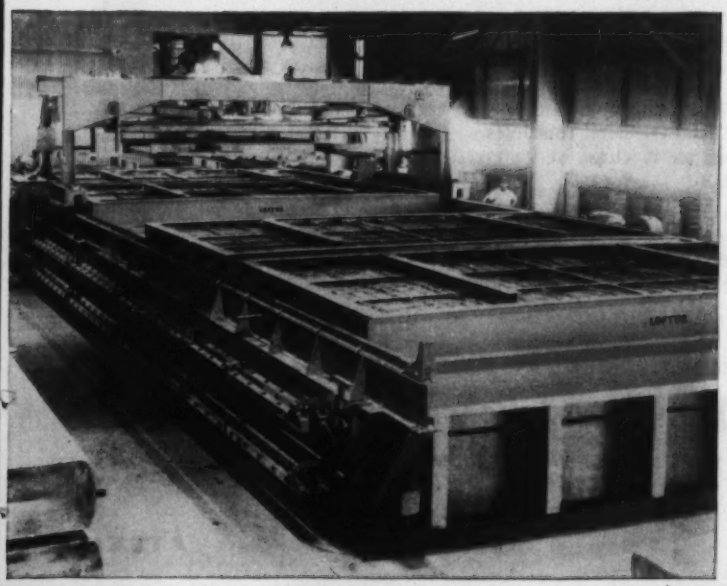
Whether building or expanding, you too can benefit from the wealth of experience available from Loftus.





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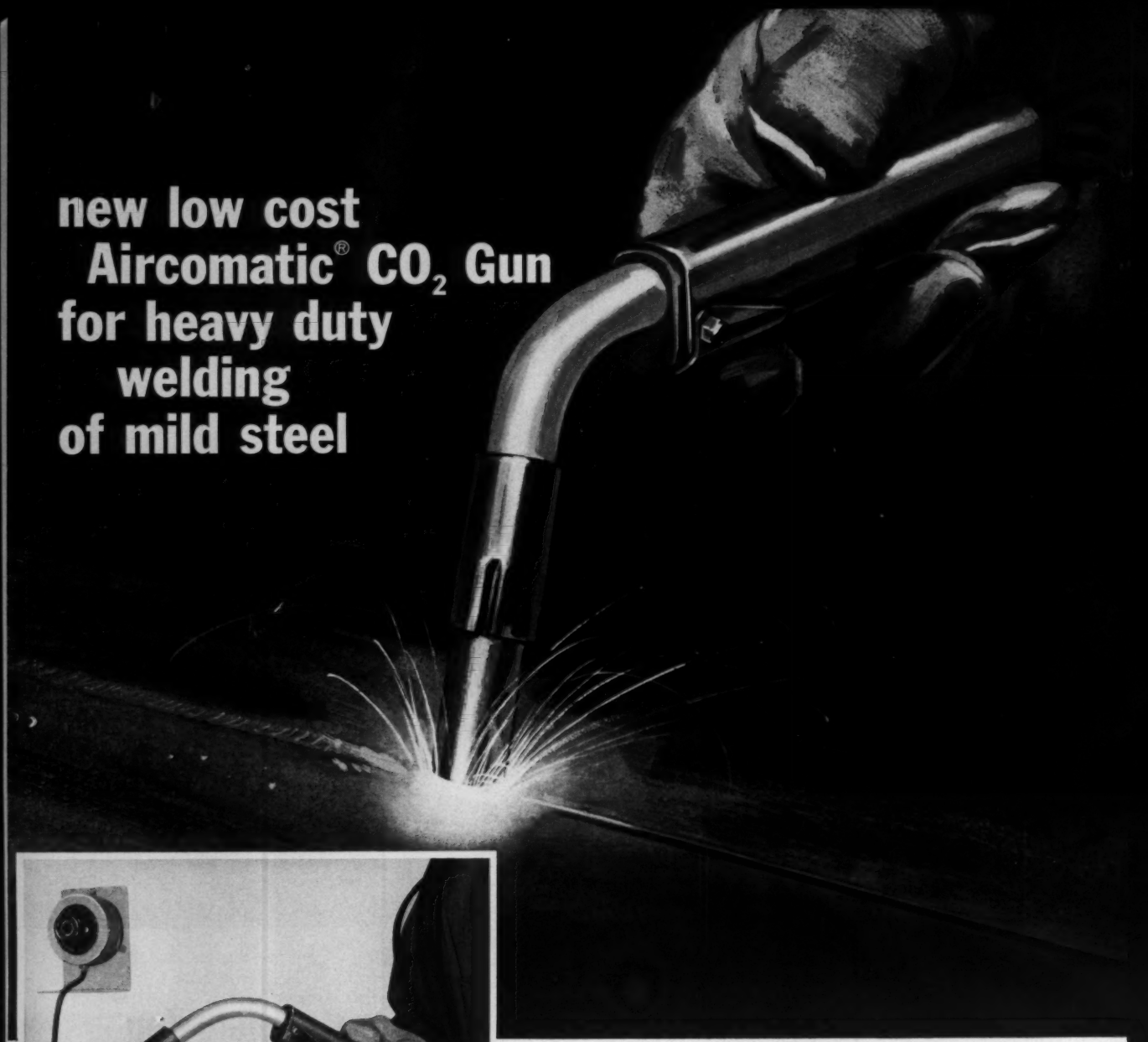

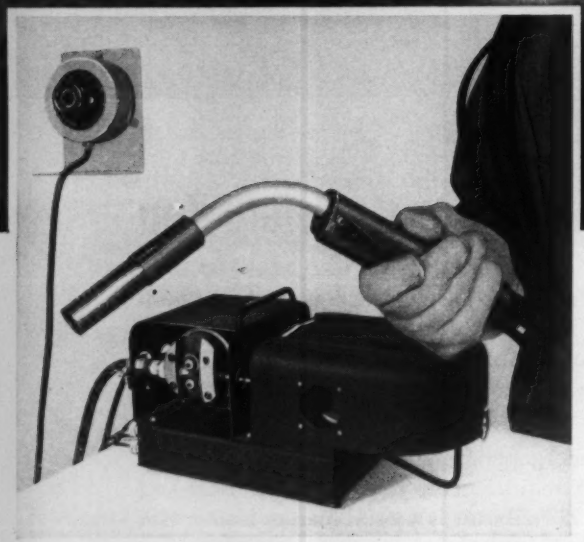

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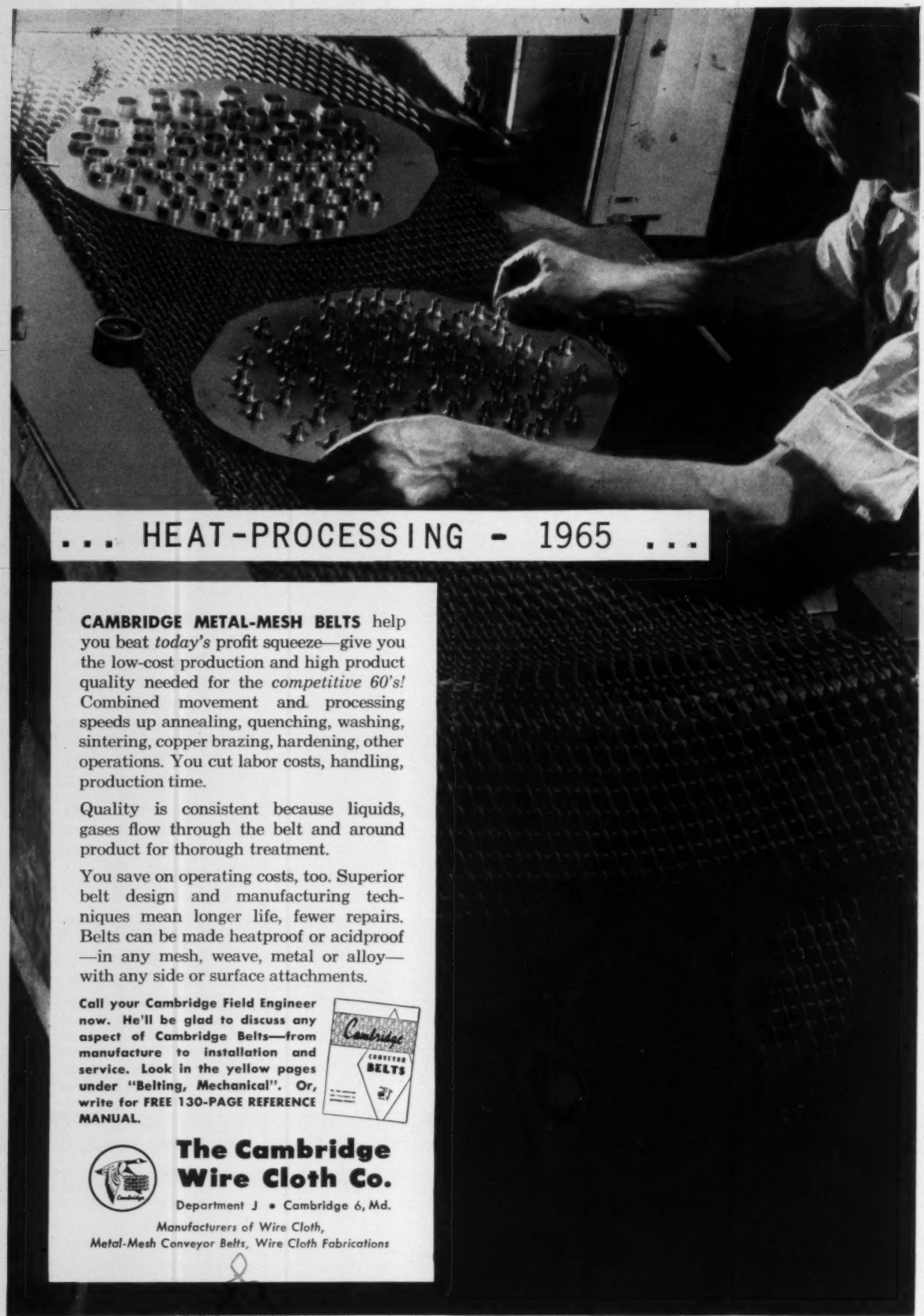

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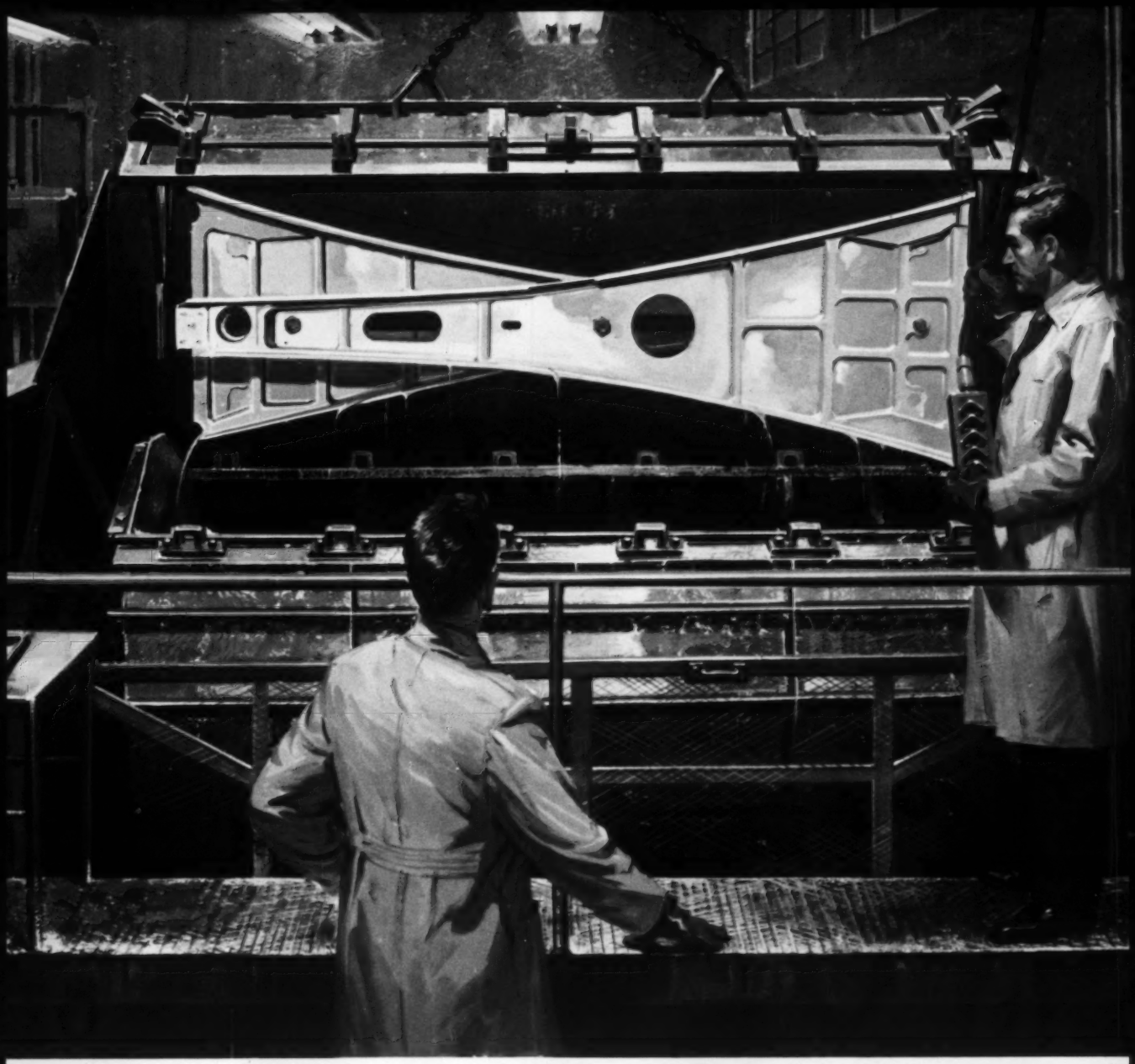

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A giant size barrel and Norton TUMBLEX* abrasive reduce the cost of putting the finishing touch on these aircraft spars.

Barrel finishing with Norton TUMBLEX* abrasive is finding more and more applications because it performs this function better, faster, and for less money than other methods.

Norton brings this value-adding, profit-increasing "Touch of Gold" to industry in the widest variety of tumbling operations . . . using six types of TUMBLEX* abrasive, each in a variety of sizes, on parts ranging from tiny needles to these seven foot spars.

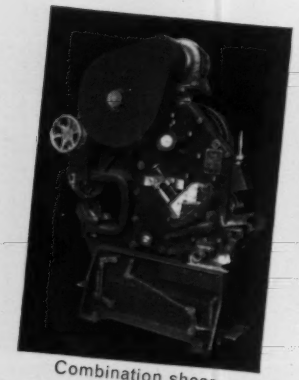
Send in your parts to our Sample Processing Department. We will finish them using the correct abrasive and send you a detailed report on methods and equipment. Send your parts to NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

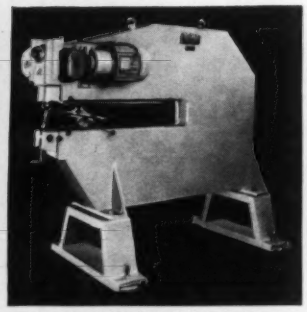
NORTON
ABRASIVES

75 years of . . . Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

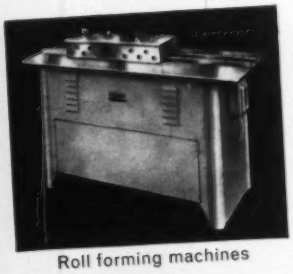


Combination shear, punch and coper

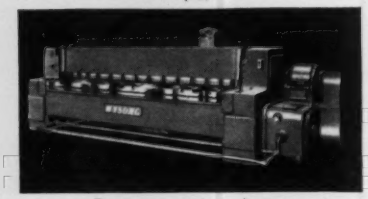


Shearing and forming machines

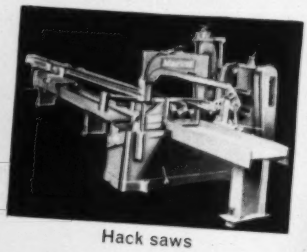
Arc welders



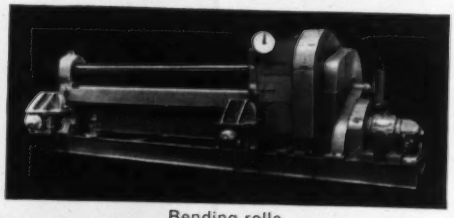
Roll forming machines



Power squaring shears

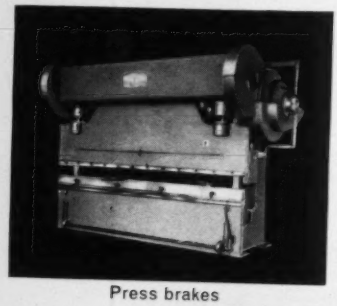


Hack saws

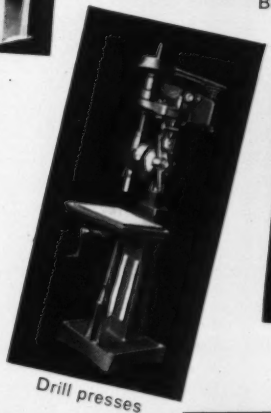


Bending rolls

Hoists

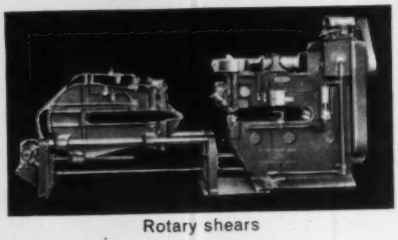


Press brakes

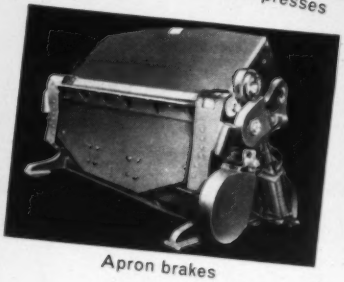


Drill presses

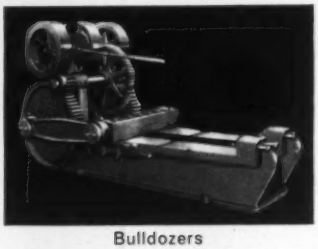
Straight side presses



Rotary shears



Apron brakes



Bulldozers

THE METALOGICS OF METALWORKING MACHINERY

375-ton rolls . . . 7½-lb. punches . . . everything in-between. Whatever you need in metalworking machinery, look to Ryerson. More than 3800 types and models are available—produced by almost 100 of the nation's top manufacturers.

And Ryerson offers unbiased recommendations based on the experience of 117 years' service to metal fabricators. You also get a double guarantee of satisfaction—ours and the manufacturers'. Consult your Ryerson machinery specialist, today.

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U. S. Clears Japanese of Steel Dumping Charge

The Treasury Department has ruled that imports of Japanese steel products into the U. S. do not violate the Anti-Dumping Act of 1921. A charge was made several months ago that Japanese steel was being sold in this country at less than cost. The Treasury says it found only "sporadic" instances of sales to the U. S. which could be considered "potential dumping prices." Those sales were made during the U. S. steel strike when "both markets were marked by unusual price fluctuations."

Economist Sees Further Business Uptrend

Martin Gainsbrugh, chief economist, National Industrial Conference Board, says industry's investment commitments for the second half, coupled with continued strength in consumer demand, should mean even higher economic activity in the second half of this year than in the first.

McDonald Loses Face

When Frank W. O'Brien was re-elected president of United Steelworkers Local 1843 (Hazelwood, Pa.) last week, it gave the USW rebels a clean sweep in their three strongholds—all targets of concentrated attack by David J. McDonald, USW chief. A week earlier, Donald C. Rarick was re-elected president of Local 2227 (at U. S. Steel's Irvin Works) and Nicholas Mamula was re-elected president of Local 1211 (at J&L's Aliquippa Works). The three are leaders of the rank-and-file insurgent movement against Mr. McDonald.

Steel's Payroll Costs Hit Another Peak

During the first four months of this year, the steel industry paid a record $1.54 billion to hourly and salaried employees, reports the American Iron & Steel Institute. Payroll cost per hour for hourly employees averaged $3.376 (vs. $3.332 in the like 1959 period).

Steel Exports Up, Imports Ease

April exports of steel mill products rose to 235,000 tons for the best month since October, 1958. Cold rolled sheets, tin plate, and rails accounted for most of the gain. Imports of steel mill products in April dropped to 331,000 tons (from 464,000 in March). But for the first four months of this year, imports are 600,000 tons greater than in the like 1959 period.

Aluminum Exports, Imports Fluctuate

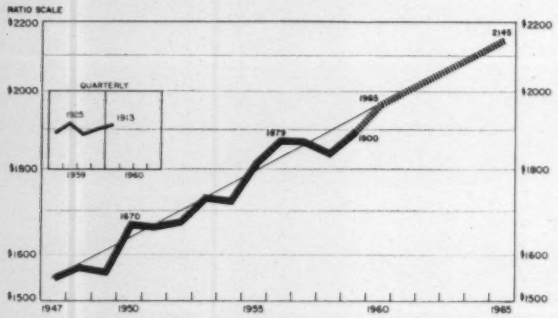
April exports of crude aluminum totaled 52.8 million lb, down 6 per cent from March, while scrap exports rose 7 per cent to 16.3 million lb, and ex-

ports of semifabricated shapes rose 11 per cent. Imports of crude aluminum dropped sharply—from 33.6 million lb in March to 15.1 million in April. Imports of semifabricated shapes dropped 3 per cent to 7.8 million lb.

"Go Global," Executive Advises

"Reorganization for global operations must become an increasingly important part of every company's planning," H. E. Humphreys, chairman, U. S. Rubber Co., asserts. He points out that the greatest need overseas—and thus an opportunity area—is not U. S. technical knowhow, but marketing and management knowhow.

Disposable Income Rising 1.8% Annually



This chart shows (in constant 1960 dollars) how per capita disposable income is increasing 1.8 per cent annually. R. J. Eggert, marketing research manager, Ford Motor Co., used it in pointing up market opportunities at the annual meeting of the American Marketing Association. He also noted: Car sales are rising 2.8 per cent annually . . . There'll be 76 million households in the U. S. by 1980 (vs. 51.3 million today) . . . Suburban areas now account for nearly 30 per cent of the U. S. population . . . College enrollment will hit 7 million by 1970 . . . Nearly 8 million households now have more than one car.

Scrapmen Await Battelle Report

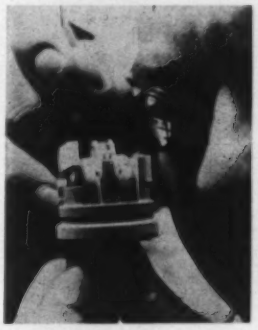
Asked by the Business & Defense Services Administration to help establish standards for No. 2 bundles (STEEL, June 20, p. 70), scrapmen meeting in Washington say the Battelle Memorial Institute (Columbus, Ohio) study must be completed first. It promises to give the scrap industry a guide for future operations. Industry leaders believe scrap quality is being improved and foresee no shortage of good scrap in the event of a shooting war. The Office of Technical Services, Commerce Department, is revising government scrap standards which were established in 1936, now obsolete for the most part.

Renault, Fiat Cut Prices; Studebaker Offers Stockholder Deal

Renault and Fiat have cut prices to maintain a competitive edge over U. S. compact cars. Fiat has dropped port of entry prices by $80 to $432. Renault has reduced the price of its 4CV sedan to $1292 from $1345; Dauphine prices remain unchanged. Studebaker-Packard Corp. is offering its stockholders a $100 discount on its cars and trucks.

Miniaturization in Ceramics

A Minneapolis-Honeywell technician uses a jeweler's eyepiece to examine a new ceramic gyroscope. Honeywell says the ceramic is as hard as sapphire and is diamond honed into the ultraprecise gyro parts. The ceramic bearings are lubricated by a film of gas only 25 millionths of an inch thick. The gyro is 2.8 in. long, 2 in. in diameter, and weighs 8 ounces. Honeywell cleans the ceramic in hydrochloric acid—which dissolves everything but the ceramic.



Computers to Make 'Vice Presidential' Decisions

Use of electronic computers in process industries is reaching the point where they can soon be expected to make "vice presidential decisions," Daystrom Inc.'s C. E. Jones told an American Management Association seminar. He predicts that computers will determine the best way to operate a plant—what to produce and in what quantities—taking into consideration market prices, transportation costs, and other factors.

GE Enters Medium Price Computer Market

Project Engineer John Fields checks one of the more than 400 logic, plug-in, boards in the GE-225, general purpose computer. It marks the company's entry into this expanding market. About 3000 transistors are used in the system, which is priced at $125,000 to $400,000, depending on auxiliary equipment—magnetic and paper tapes, controllers, high speed printers, card readers, mass storage memories, magnetic ink character recognition.

NAA Sets Pattern, but Labor Unrest Still Strong in Aircraft

Strikes and strike threats continue to harass aircraft-missile makers, although North American Aviation Inc. and the United Autoworkers reached a settlement. The NAA two year pact leaves wages unchanged this year but sets up a new plan for layoff benefits: Workers laid off four consecutive weeks will receive a lump sum payment of $50 for each year of service to a $500 maximum. Pension payments are increased; so is hospitalization insurance. And Saturday work will be at premium rates, regardless of the number of previous hours worked during the week. A 7-cent-an-hour wage hike goes into effect in June, 1961.

Economic Notes

The number of business failures turned down in May for the first time this year, but their dollar liabilities climbed to the largest volume in 16 months, Dun & Bradstreet reports . . . Heavy construction contract awards during the first 24 weeks of this year stand 9 per cent above those during the like

1959 period, reports *Engineering News-Record* . . . May vacuum cleaner sales rose 3.2 per cent above the level of the year-earlier month, says the Vacuum Cleaner Manufacturers Association . . . Gas water heater sales in May dropped 15.7 per cent below those for the year earlier month, reports Gas Appliance Manufacturers Association.

How Ford Will Check New Model Reaction

For one week in September, every car and truck in Flora, Ill. (Pop.: 6000) will be replaced with a '61 Ford. Purpose: A comprehensive check of reaction to new models. Ford will feed "every available fact about the city and its residents" into a RAMAC 305 to compile and analyze the reasoning behind the population's reaction.

Pullman Debuts Double-Deck Flatcars for Auto Transport

Double-deck flatcars, developed by Pullman Inc., were recently demonstrated on the St. Louis-San Francisco Railway for Willys Motors Inc., Toledo. A dozen Jeeps rode on the new railroad car which Pullman hopes will attract more auto hauling business from the trucking industry. Some railroads are already carrying autos on other specially built cars or on piggyback units.

Straws in the Wind

St. Lawrence River Mines is considering the production of niobium (columbium) . . . Aluminum Co. of America says it has developed a new group of alloys displaying "amazing resistance" to high temperature steam and water . . . George Romney says American Motors Corp. definitely is not considering a merger with Chrysler Corp. . . . The Small Business Administration has issued a directory of 2674 small businesses qualified to do research and development in 33 areas . . . U. S. residents spent $2.4 billion on foreign travel in 1959—11 per cent more than in '58, says the Commerce Department . . . American Motors Corp. says it saved $122 per car on a shipment of 50 Ramblers to Kuwait, Arabia, by using the St. Lawrence Seaway vs. shipping overland to an ocean port . . . Annual spending for plant and equipment will have to approach $70 billion by 1970 (vs. $50 billion in '57), if the growth rate for the stock of private capital is to average 3 per cent annually, notes Wheeling Steel Corp.'s Forrest Kirkpatrick.

Metalworking Pulse

The Business Trend: Summer weakness is beginning to show up in STEEL's industrial production index. Steel production is still low and both railroad freight carloadings and auto output will ease soon. Only electric output will head seasonally upward. **Autos:** Makers are having inventory and labor troubles, causing some softness in production schedules. **Steel:** The ingot rate resumed its decline with the approach of the July 4 holiday and vacations.

- **INDUSTRIAL PRODUCTION**
  - Week ended June 18 . . 156†
  - Year ago 174
  - Details on Page 63
- **PASSENGER CAR PRODUCTION**
  - Week ended June 25 . 140,000*
  - Year ago 127,217
  - Details on Page 60
- **INGOT PRODUCTION RATE**
  - Week ended June 26 . . 61.0%†
  - Week ago 62.3%
  - Details on Page 128

†Preliminary. *Estimated.

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INTEGRAL FIN U-TUBES
for HEAT EXCHANGERS and REBOILERS

Now get steel integral fin or plain U-tubes on pallets from one source! Michigan Seamless has TAILORED TUBING, tailored to your specifications and ready for your heat exchanger. Buy TAILORED TUBING for minimum handling, minimum shipping cost, no scrap loss—deliveries on time! A variety of lengths, wall thicknesses and alloys, radii up to 24". Contact your Michigan Seamless representative. In the Southwest, call Gulf States Tube Corporation.

MECHANICAL, AIRCRAFT, PLAIN AND FINNED HEAT-EXCHANGER TUBING

MICHIGAN SEAMLESS TUBE COMPANY
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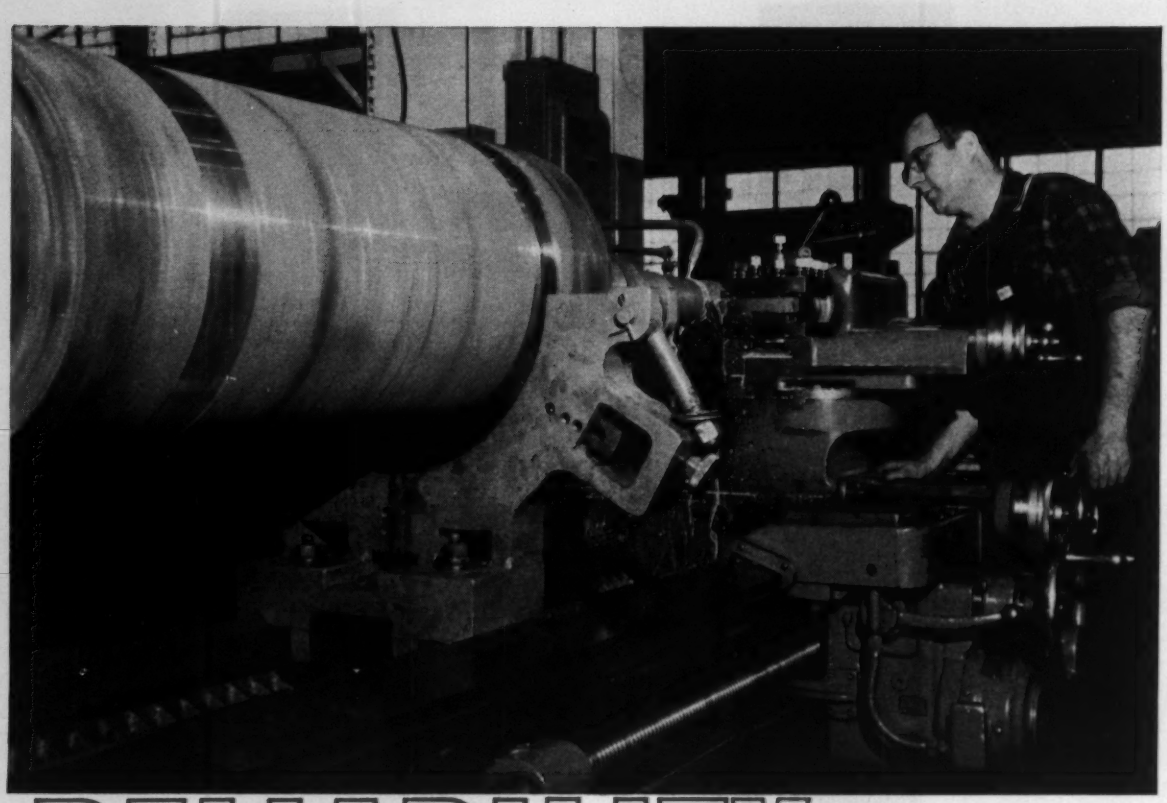
A SUBSIDIARY:

GULF STATES TUBE CORPORATION
ROSENBERG, TEXAS



RELIABILITY:

Reason enough to buy LeBlond

Valuable as five fingers on a hand, these five great LeBlond lathes run round the clock, year in, year out, at the Warren, Ohio, shops of Wean Manufacturing Co. Wean has six LeBlonds in all, including the five in the picture, all purchased in the last five years.

The operations they perform are typically job-shop. Lots are small—five parts alike are a big run; materials may vary from hardened steel to copper. Fat mill rolls, long whippy spindles, sturdy stepped shafts—the rugged LeBlonds take them as they come and turn them quickly and accurately, regular as clockwork.

Much of Wean's output goes into steel mill equipment that can be relied on to hold up under the most exacting requirements—the same steadfast degree of reliability that LeBlond lathe customers expect, and get.

RELIABILITY is a good reason to buy a lathe. It is reason enough to buy LeBlond.

See LeBlond Booth 810 at the Machine Tool Exposition in Chicago, September 6—16. MMT-PE

THE R. K. LEBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio

LEBLOND *of Cincinnati*

Business Is What You Make It!

We asked the president of a metalworking company a question that's troubling practically everyone these days:

"How's business?"

"Frankly," he said, "Our industry is wracked by price cutting. Our company's business is not too good at the moment, but we expect it to get better."

We admired his objective appraisal for this reason:

Too many people base their estimate of the business outlook on hearsay, intuition, or a spot situation.

To check on what really is happening, STEEL's editors went to 6200 metalworking managers for specific answers.

The report (Page 43) merits careful study.

As might be expected, about one-fifth of the executives expect 1960 sales will be below 1959's.

Another fifth expect no improvement.

But nearly three-fifths of the managers expect sales to be up.

After balancing the plusses and minuses, the net result is a 5 per cent increase in metalworking sales—$152 billion vs. $145 billion in 1959.

Thus 1960 is turning out to be a record year for metalworking, although it's less spectacular than expected six months ago.

It could have been a better year for many companies were it not for price competition.

It is cited as the No. 1 problem by 8 out of every 11 people reporting, thus overshadowing other problems of the day, such as tight money, foreign competition, pressure for wage increases, and inadequate depreciation allowances.

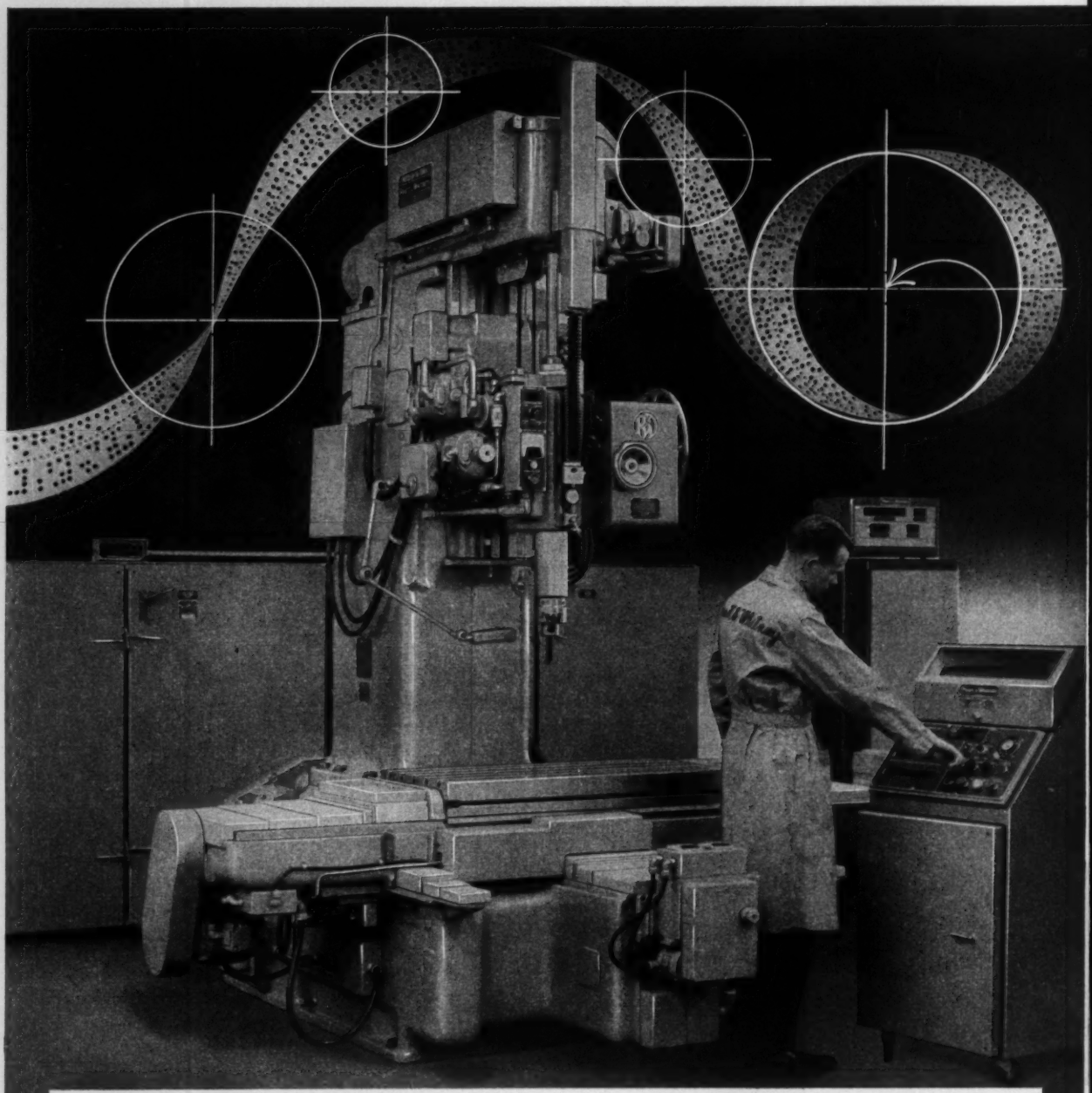
It is a problem created by management itself, and management itself must provide the solution. Aiming for a reasonable profit is an integral part of constructive business planning.

In many respects, your business is what you make it.

Irwin H. Such

EDITOR-IN-CHIEF

ACCURACY



"Floating" Zero . . . an exclusive P&W feature, makes it possible to establish or re-establish the zero point for a machining job at any convenient location or reference point. This simplifies preparation of positioning data, provides important savings in setup time, allows more complete process planning freedom, makes it easy to machine multiple pieces in a single setup in any desired sequence. Parts larger than the machine's capacity are easily handled by repositioning and re-establishing the zero point.

ASSURED...

. . . *plus* unmatched flexibility and versatility with PRATT & WHITNEY Numerically Controlled Jig Borers

Only Pratt & Whitney Numerically Controlled Jig Borers offer you the unique advantages of a machine, a super-accurate measuring system, and a numerical control system all originated, engineered and manufactured by the same company. This results in an unequalled flexibility and versatility that let you take unrestricted advantage of the machine's capabilities, provide the greatest possible degree of freedom for the operator and the process planner, and help you handle both production and tool room jobs with maximum speed, ease and economy.

If you're planning to purchase a numerically controlled jig borer – and want this investment to pay back full dividends – check over this list first, and make sure the machine you choose offers *all* these important Pratt & Whitney features and advantages:

Alternate Manual Control . . . using P&W's exclusive telephone dial system, provides the flexibility needed for fast, easy setup or for machining simple work.

Position and Sequence Display . . . shows the table location and operation sequence number on an easily read panel. This provides a positive visual check, operating under either tape or manual control.

Numerically Controlled Spindle . . . now optionally available for all P&W Numerically Controlled Jig Borers, provides fully automatic selection of spindle speeds and feeds, automatic rapid traverse positioning of spindle and quill above the work, and automatic control of boring depth and cycle. Operator has only to clamp the work on the table, start the cycle, and change tools.

Tape Advance Control . . . gives operator the option of: advancing tape by push button, by-passing any desired position, or setting the machine for automatic advance. For high-output, repetitive work, the tape can be formed into a loop to provide automatic cycle repeat without re-winding.

Protective Devices . . . prevent misuse that could damage the machine or its control system. Included are: Limit switches that prevent moving the table while the spindle is engaged in the work, a "set light" that is displayed when the table reaches its correct position, and a tape-reading system that prevents tapes from accepting incorrect codes.

EXTREME ACCURACY . . . When you choose a P&W Numerically Controlled Jig Borer, you can be sure that no other jig borer – manually or numerically controlled – is more accurate or will retain its accuracy longer!

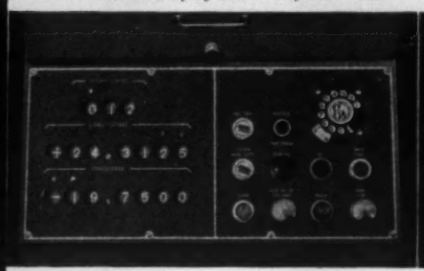
For complete information, call the P&W Branch Office in your area . . . or write direct, outlining your requirements.

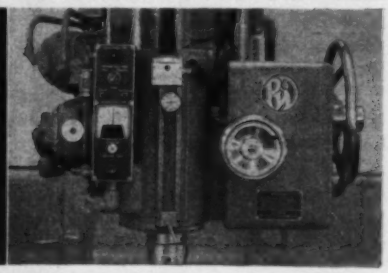
PRATT & WHITNEY, INC.
13 *Charter Oak Boulevard, West Hartford, Connecticut*

OPERATOR'S CONSOLE . . . with Table Position Display and "Telephone" Dial.

SEPARATE DISPLAY PANEL — is provided for the spindle control system

NUMERICAL-HEAD SYSTEM . . . provides automatic control of all spindle functions.





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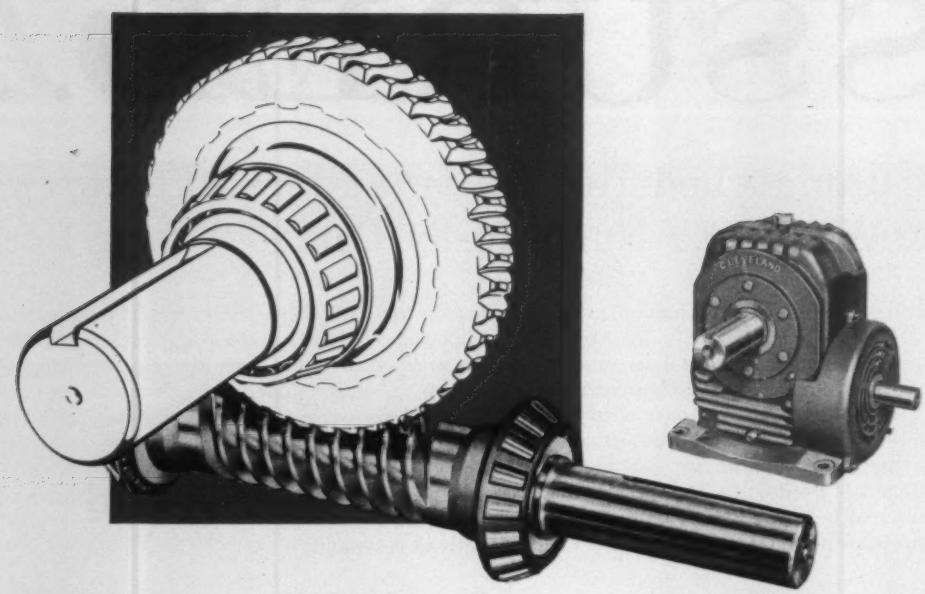
MACHINE TOOLS • GAGES • CUTTING TOOLS



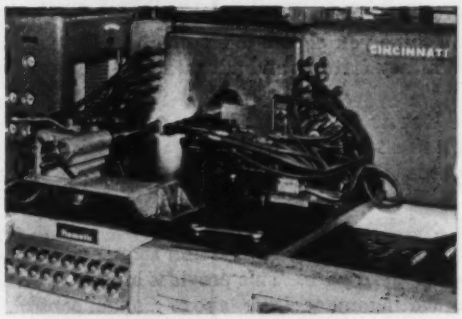
Flamatic-hardened worms help give Cleveland Speed Reducers their longer service life . . .

On all Cleveland Speed Reducers, alloy steel worms are cut integral with the shaft and accurately ground to a high surface finish on both thread flanks. Shaft extension diameter is especially large to permit increased overhung load capacity. Heat treating is by means of an acetylene-oxygen flame at 3300° F. —exclusive with Cleveland-made worms. This provides a high degree of hardness throughout the entire thread thickness and well below the worm's root diameter—(See etched worm cross-section).

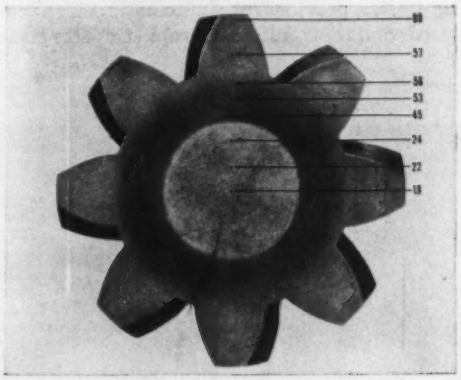
This new worm hardness pattern gives maximum thread strength and resistance to wear without sacrificing the advantage of a medium-hard tough core. Furthermore, the pattern is carried out in the worm shaft extension past the oil seal wearing surface to prevent the shaft being worn and damaged by its oil seal.

Mated with Cleveland's high density centrifugally cast bronze gears, the result is increased wear resistance—much longer trouble-free service life.

Why not write today for your free copy of Bulletin No. 405 showing the latest developments in the Cleveland Worm Gear Line. Or, better yet, contact your nearest Cleveland Representative and get the complete facts.

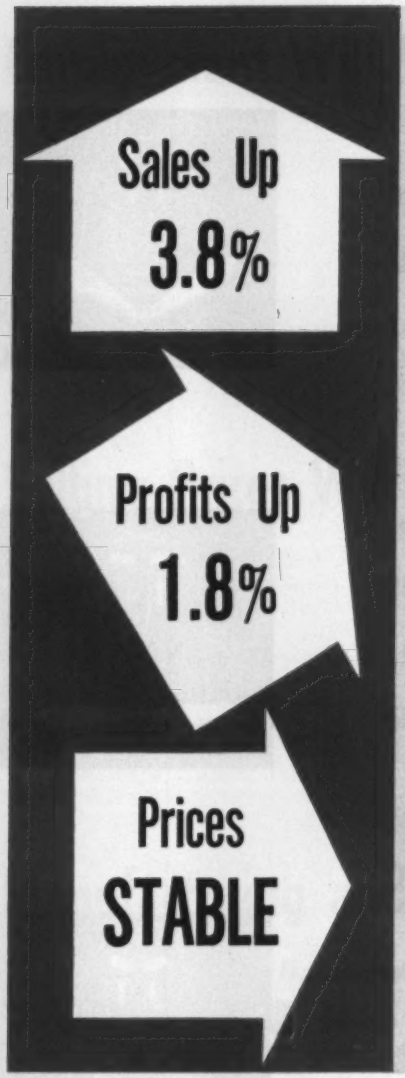


Worms are Flamatic-hardened in the Cleveland Plant (above) to give them the typical Rockwell "C" hardness pattern as shown in the etched cross-section (below).



CLEVELAND
Worm Gear
Speed Reducers

Cleveland Worm & Gear Division
Eaton Manufacturing Company
3270 East 80th Street • Cleveland 4, Ohio



Metalworking Managers Expect

Sales Volume to Rise 3.8% in Last Half

LAST HALF vs. FIRST HALF, 1960:

51.1% Expect Increase
17.1% Expect Decrease
31.8% See No Change

And Dollar Volume for Year, 1960, to Jump 5.1% Above That of 1959

1960 vs. 1959:

57.2% Expect Increase
20.2% Expect Decrease
22.6% See No Change

A SOLID VOTE of confidence in second half business has been cast by the men who manage metalworking.

STEEL asked 6100 general managers of metalworking plants how they think their plants will fare in 1960's second half. Their robust response:

- Second half sales (in dollars) will climb 3.8 per cent above those of the first half.
- Sales for all of 1960 will rise 5.1 per cent above the 1959 level—giving metalworking a record $152 billion year.
- Costs will rise as labor wins new gains, marketing budgets are boosted, research and development efforts get more dollars.
- Prices will hold almost steady on the average—though most managers see widespread price warfare continuing.
- Employment will edge up—with the biggest gains coming in small plants.
- Profits will improve but they won't rise in proportion to sales.
- R&D spending will be lifted as

DOLLAR VOLUME INCREASES

Analysis by Industries	Last Half, 1960, vs. First Half	Year, 1960, vs. Year, 1959
S.I.C. 33—Primary metals	1.9%	3.2%
S.I.C. 34—Fabricated metal products	4.7%	3.3%
S.I.C. 35—Machinery (except electrical)	3.2%	7.0%
S.I.C. 36—Electrical machinery	1.4%	8.6%
S.I.C. 37—Transportation equipment	0.6%	2.1%
S.I.C. 38—Instruments, related products	11.5%	8.0%
Other metalworking industries*	8.5%	3.7%

*S.I.C. 19, 25, and 39.

plants compete with a deluge of new products.

• Manufacturing capacity will be boosted 4.7 per cent, with much of the increase coming as a byproduct of modernization programs.

• The manpower shortage will ease somewhat but continue to be severe in many quarters.

• **Small Plants Optimistic**—Plants employing less than 100 look for a 4.5 per cent sales increase in the second half vs. the first; plants employing 100 to 499 expect a 2.8 per cent increase, and those employing 500 or more expect a 3.8 per cent gain.

Plants employing less than 100 predict that their dollar volume for the year will be 5.6 per cent greater than that of 1959; those employing 100 to 499 expect a 4.9 per cent increase; those employing 500 or more look for a 3.7 per cent rise.

• **Price Dilemma**—You can expect practically no inflation in metalworking during the second half. Only 1 in 4 plants intends to boost prices; 1 in 10 expects its quotations to be lower. Behind the price softness are two powerful forces:

1. Most industries have considerably more manufacturing capacity than is needed to meet current demand. To spread the overhead, some plants offer prices substantially below normal quotations; their competitors try to fight back with the same tactics. The result resembles bush warfare: Snipers are everywhere.

2. Some price reductions are legitimate. They result from effective campaigns to trim costs and hike productivity. Often, the plants that are successful in that kind of effort are the same plants that produce the top quality products in a field. Their competitors are forced to resort to price cutting to hold a share of the industry volume.

"Competitors are cutting prices, upsetting the market"—**Valvemaker.**

"Buyers are tending to purchase capital equipment at the lowest prices, paying too little attention to quality and maintenance"—**Builder of material handling equipment.**

"Due to the increase in the number of suppliers, competition is getting extremely tough in our industry"—**Missile industry supplier.**

"We are forced to cut prices to meet competitors who have cut prices to meet foreign competitors"—**Machinery producer.**

"Price fighting is forcing us out of business"—**Structural steel fabricator.**

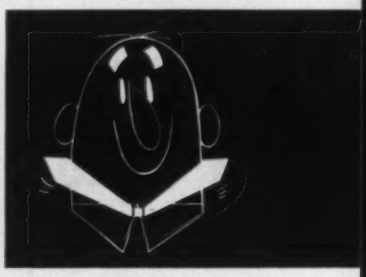
• **Profits Suffer**—The average metalworking plant expects net profits to rise only 1.8 per cent in the second half—on a 3.8 per cent increase in sales. And 1 in 4 plants expects its second half earnings to be lower than those of the first half. Only strong spot: Producers of instruments and related products expect second half profits to jump 7.3 per cent above those of the first half.

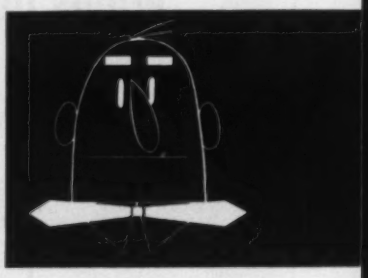
The managers surveyed frequently mention these profit deterrents: 1. Price competition. 2. Inadequate depreciation allowances. 3. Rising state and local taxes. 4. Mounting labor costs. 5. The need to hoist salaries to keep good engineers, scientists, managers, and even secretaries. 6. High interest rates. 7. Rising research and development costs. 8. The need to increase marketing budgets to retain markets.

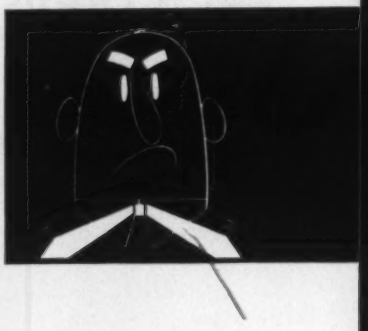
• **Capacity Climbing** — Although most industries have excess manufacturing capacity, metalworking will add another 4.7 per cent in the last half. About 1 in 3 plants will hike capacity—in most cases, as a byproduct of a modernization or re-equipment program.

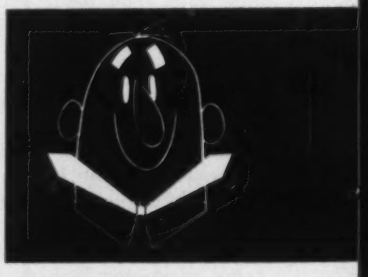
Biggest capacity increases will come in the instruments industry (9.8 per cent), electrical machinery and equipment industry (5.5 per cent), and the primary metals industry (4.3 per cent).

• **Lack of Money Stops Some**—About 1 in 7 plant managers told

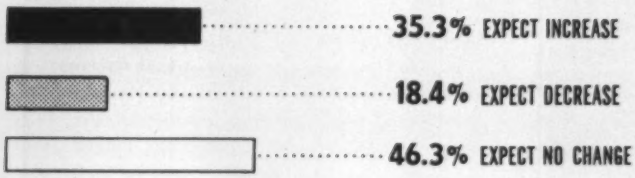








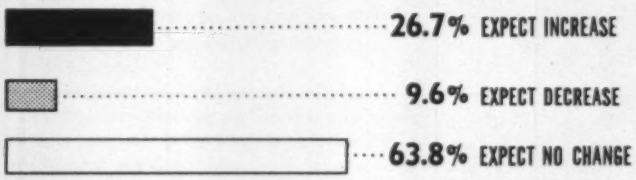
Employment Will Be Lifted 1.2%



ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	0.2%
S.I.C. 34—Fabricated metal products	1.6%
S.I.C. 35—Machinery, except electrical	0.7%
S.I.C. 36—Electrical machinery	1.1%
S.I.C. 37—Transportation equipment	1.2%
S.I.C. 38—Instruments, related products	8.6%
Other metalworking industries*	2.0%

*S.I.C. 19, 25, and 39.

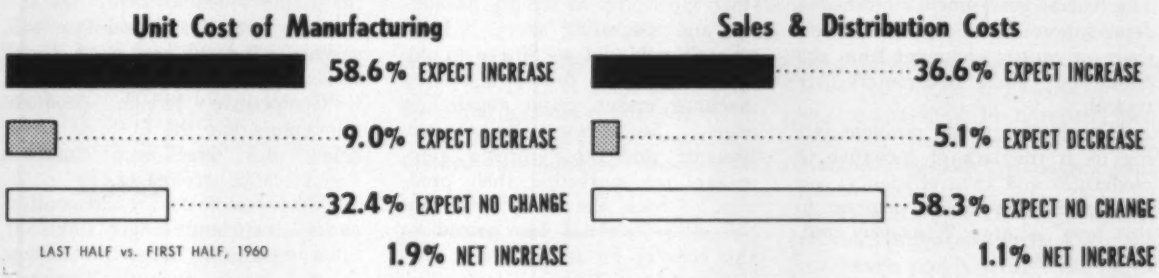
Selling Prices Will Stabilize



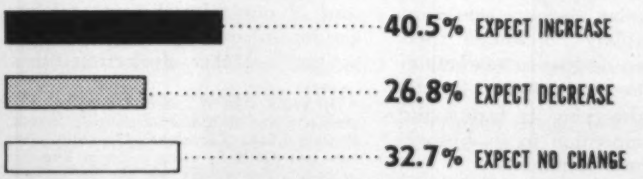
ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	0.7%
S.I.C. 34—Fabricated metal products	0.6%
S.I.C. 35—Machinery, except electrical	0.8%
S.I.C. 36—Electrical machinery	0.2%
S.I.C. 37—Transportation equipment	0.4%
S.I.C. 38—Instruments, related products	0.8%
Other metalworking industries*	0.4%

*S.I.C. 19, 25, and 39.

Manufacturing and Marketing Costs Will Increase



Net Profits Will Advance 1.8%



ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	1.1%
S.I.C. 34—Fabricated metal products	1.8%
S.I.C. 35—Machinery, except electrical	1.0%
S.I.C. 36—Electrical machinery	1.7%
S.I.C. 37—Transportation equipment	0.7%
S.I.C. 38—Instruments, related products	7.3%
Other metalworking industries*	5.0%

*S.I.C. 19, 25 and 39.

Metalworking Managers Expect

R&D Spending Up 2.4%

34% EXPECT INCREASE
3% EXPECT DECREASE
63% SEE NO CHANGE
(in 1960 vs. 1959)

44.1% of plants will introduce new products in the second half.

Export Sales Up 2.1%

42.2% of metalworking plants produce for export. Of those . . .

33.7% EXPECT INCREASE
18.9% EXPECT DECREASE
47.4% SEE NO CHANGE
(in 1960 vs. 1959)

Production Capacity Up 4.7%

27.7% of plants expect to increase their manufacturing capacity. Of those . . .

12.8% BUILD NEW PLANTS
30.2% BUILD ADDITIONS
63.2% BUY EQUIPMENT
(in last half, 1960)

ANALYSIS BY INDUSTRIES

	INCREASES EXPECTED		
S.I.C. 33—Primary metals	1.1%	2.1%	4.3%
S.I.C. 34—Fabricated metal products	1.7%	1.8%	1.3%
S.I.C. 35—Machinery, except electrical	1.9%	2.0%	2.0%
S.I.C. 36—Electrical machinery	6.4%	3.9%	5.5%
S.I.C. 37—Transportation equipment	1.5%	0.2%	1.5%
S.I.C. 38—Instruments, related products	4.5%	3.4%	9.8%
Other metalworking industries*	3.7%	1.3%	1.8%

*S.I.C. 19, 25, and 39.

STEEL that capital shortages will hold back planned expansions. Especially hard hit are the plants employing less than 100.

• **So Does Depreciation Policy**—The federal government's outmoded depreciation laws earned their share of caustic comment from the managers. These two remarks are typical:

"The largest single problem facing us is the lack of incentive to modernize and raise efficiency; our tax system discourages progress in this area"—Large Wisconsin component maker.

"To compete with imports, we must lower our costs through investment in automated equipment. The alternative is loss of markets, then loss of U. S. capacity, then loss of a strong defense posture. But there are two huge roadblocks to automation: Inadequate depreciation allowance and the backward thinking of union officials"—Steel producer.

• **Fight for Survival**—No longer is any metalworking plant safe from the merciless attack that European and Japanese metalworkers are waging to win world markets. Name a metalworking product and you'll find a foreign firm producing—or planning to produce—it. And no longer can the U. S. claim clear superiority in design, durability, and marketing savvy. Look what Necchi did to Singer in design before the American sewing machine maker could regain an edge. See how Volkswagen, Renault, and other foreign automakers are marketing their products. Check the acceptance that Sip of Switzerland has gained in this country for its jig borer. Examine the quality of some foreign-made electronic products.

Our competitors abroad have the labor force, the raw materials, the equipment (in most cases), and the capital to compete in the world market—and they get those resources at far below our cost. They're rapidly building their knowhow—in design, in marketing, in production processes. Result: U. S. metalworking is facing the toughest competition in its history. Listen to these comments:

"No matter what we make, Japan or some other country can make it cheaper. So we must develop equipment to lower our costs—to make every production worker able to turn out twice as much product as he does today. It'll be tough on the nation's employment, but it's the only way U. S. industry will survive"—Indiana maker of metal casket shells.

"Competitive foreign products are coming into the U. S. at prices below our break-even costs"—Pennsylvania steelmaker.

"Most customers are demanding easier credit and longer terms or other concessions when purchasing domestic items. Reason: They can buy foreign products cheaper. We must find a way to grant their wishes by lowering our costs or we'll be forced to fold"—New England toymaker.

"We're losing money on 50 per cent of our sales, because we are quoting prices to meet foreign competition"—Maker of electron tubes.

• If you'd like to have a copy of this article, write to Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. You may win $1000 by using material like this in STEEL. For details, see the Servicenter, Pages 5 and 6.

Repair Shops Adopt Marketing Look

ALERT customer service managers are discovering some useful marketing tools in their repair kits.

The new look in the repair shop supports a trend spotted by STEEL at the first of the year: Customer service is playing a major role in selling prospects and keeping them sold (STEEL, Jan. 18, p. 56).

Service personnel have unique marketing opportunities: They are often in closer and more frequent contact with a customer than salesmen; they often have the critical job of advising a customer whether to repair or replace a product; they are well suited to assist customers with technical advice, instructions, or training; they can be invaluable in testing new products in service.

• Addressograph-Multigraph Corp., Cleveland, is placing additional emphasis on its program to market equipment service.

Continuous maintenance agreements are the key to holding down service and repair charges to customers . . . and to operating service facilities in the black, says Harold Cook, A-M's general service manager.

After selling a maintenance agreement, an Addressograph or Multigraph local serviceman makes regular stops in offices where A-M equipment is operating. He cleans and lubricates equipment and replaces worn parts; he can also, on short notice, handle breakdowns.

Because servicemen spend 85 per cent of their time on established maintenance routes, a number of savings result:

- Service personnel are not drawing pay for idle time between emergency calls.
- Costly breakdown time in the customer's office is reduced.
- Localized routes mean the serviceman's time and transportation costs are, in effect, prorated among customers in the same area. Without maintenance agreements, confides Mr. Cook, the hourly rates for servicemen would have to be considerably higher.

Addressograph-Multigraph Corp.

• At Hickok Electrical Instrument Co., Cleveland, a home office service center handles repair jobs.

In contrast with the large, permanent installations which A-M must service in the field, Hickok's industrial meters and electronic test sets are serviced in a repair shop near the main production plant. National Service Manager Carl Lenke concentrates on precision service and inspection to insure that reliable equipment is back in the customer's hands within ten days.

Mr. Lenke emphasizes that well trained, well paid personnel who can work independently are the biggest asset in service work. Efficient service, he says, "is not just finding the trouble and fixing it but taking care to put the equipment back in condition to operate at its designed capability."

Both service managers agree that customer satisfaction must be the prime objective of the service function. Once the repair job becomes fully customer oriented, it often begins to pay extra dividends.

Service Management Can

Operate independently "in the black."

Reduce customers' repair and bills for parts.

Eliminate surplus manpower for "putting out fires."

Win new customers and keep old ones happy.

Pinpoint design and production soft spots.

The marketing story behind . . .

Getting 'Them' To Use Bolts

HOW DO YOU market a new bolt?

A good example: The successful marketing approach used by Lamson & Sessions Co., Cleveland, for its new high strength bearing bolt.

• **An Old Problem**—The task before the company was to find a method to glamorize the bolt and tell about the kind of job it is designed to do. Also, it was necessary to reach as many people as possible in a wide range of interests. This is what was done:

Together with its distributor, U. S. Steel Supply Div. of United States Steel Corp., Lamson & Sessions has told the story of the bolt to at least 500,000 through the printed word and orally.

The bearing bolt has been introduced personally to 6000 people on a crosscountry tour. By yearend, a series of technical meetings will have been held in 30 cities.

Star of the road show, of course, is the new bolt. In the supporting cast are Col. A. E. R. Peterka, manager of marketing services, and William E. Long, structural bolt project engineer, Lamson & Sessions; and Carl E. Seidl, specialty product manager, U. S. Steel Supply Div., Pittsburgh.

• **Scope of the Program**—Through the meetings, Lamson & Sessions' officials say that personal contact is made with these groups: Industrial architects; structural, consulting and design engineers; industrial contractors; structural fabricators; steel erectors; city, county, and other government officials (inspectors, highway engineers, building code officials); American Institute of Steel Construction representatives; Structural Fabricators Association officials and members, and representatives from the mining, railroad, heavy machinery and equipment manufacturers, and agricultural implements industries.

Now just past the halfway mark, the three-man team has visited 16 cities. Three days of meetings—luncheon and dinner sessions—are scheduled for Cleveland this week.

Says Mr. Peterka: "The results have been tremendous. I don't believe anyone has ever promoted a bolt in this way. We'll spend $75,000 this year just for the meetings. We started from scratch with this product. In 1959, we manufactured about 2 million high strength bearing bolts. We anticipate a substantial increase in this volume in 1960."

Says Mr. Long: "Inquiries on the bolt have been coming in at a fantastic rate. I feel that we have done a successful job. The potential for the high strength bearing bolt is as big as any other product we manufacture."

The bolt has been generously advertised. In the first half of 1960, ads were placed in nine business papers and technical magazines with a combined circulation of more than 360,000, relates William A. Ziegler, Lamson & Sessions' assistant advertising manager.

• **Story of the Bolt**—The high strength bearing bolt combines the desirable features of a hot driven rivet and a standard high strength structural bolt, says William G. Waltermire, chief product engineer, who developed the bolt.

The ASTM A-325 bolt, made of heat-treated, high carbon steel, has a spirally knurled body. When it is driven or pulled into place, it produces a body-bound fit. The head is shaped like a driven rivet head to permit driving with standard tools. Only one washer is needed. A washer is not required under the head.

Extensively tested (Prof. W. H. Munse, University of Illinois) and industry approved, company officials

say the bolt has higher shear strength and bearing values and greater slip resistance than high strength bolts or rivets.

Installation is said to be less expensive because fewer bolts are needed and they can be installed by fewer men. And no special training is required.

• **How Bolt Goes to Market**—Key to the successful marketing program is the close co-operation and detailed plans developed between Lamson & Sessions officials and U. S. Steel Supply Div. representatives, says Mr. Long.

An 11-page, minutely detailed plan was prepared for the presentations. It fixes responsibilities and sets up a timetable for each show.

U. S. Steel Supply Div. salesmen play important roles in the program. They assist in building the guest list, help out as hosts at the shows and follow up on each guest in an attempt to further buying or specifying action.

To date the show has played to 45 audiences in Newark, N. J.; Philadelphia, Houston, Dallas, Ft. Worth, Tex.; St. Louis, Kansas City, Mo.; Los Angeles, Portland, Oreg.; Seattle, San Francisco, Ft. Wayne, Ind.; Moline, Ill.; Davenport, Iowa; Chicago, and Milwaukee.

On tap are Boston, Baltimore, Washington, Memphis, Tenn.; Birmingham, St. Paul, and Duluth. Others are to be added.

• **The Show Goes On**—"We use the 'stop watch' method to keep 'em awake," says Mr. Long. "At least 100 men have thanked us after shows for being so precise and doing what we said we would do."

Each phase of the 55-minute presentation is carefully timed—from welcoming remarks (3 minutes) to summation (5 minutes). A demonstration showing how the bolt is used takes 30 minutes. Persons attending are invited to try a pneumatic wrench on the new bolt.

Both Mr. Peterka and Mr. Long are enthusiastic over the quality of the audiences.

"It would be rare if a salesman called on a consulting engineer or architect," says Mr. Peterka, "but these are the men who specify—our prime targets. We have captive audiences—there are no interruptions."

Marketing's Role Changing

Last week, in the "land of lakes," the nation's marketing men gathered to exchange ideas on "dynamic marketing for a changing world." The occasion: American Marketing Association's 43rd annual meeting at the Leamington Hotel, Minneapolis. Here are highlights:

● **"The marketing executive of the 1980s may expect to find that he has to work more and more closely with other executives on all kinds of decisions. He may expect greater emphasis on research and quantification of decision information. He will have to understand the work of mathematicians, statisticians, economists, and others, and his own knowledge will have to be equal to it."**
—**Thomas L. Whisler,** associate professor Graduate School of Business, University of Chicago

● **"Science is infiltrating marketing. A variety of well-proved techniques, properly integrated and co-ordinated, will permit the study of marketing strategy problems down to such fine points of balance that the manager himself may become obsolete in many decision making areas. We have already reached the stage where the marketing manager who does not employ some systematic market research is obsolete."**
—**Theodore Levitt,** lecturer on business administration, Harvard Business School

● **"In general, most U. S. companies do not differentiate in their product, marketing strategy, and pricing policies between domestic (and foreign) markets. European manufacturers, however, have a different approach to foreign markets. They have sensitively cultivated a separate approach to foreign trade."**
—**Erich Gansmuller,** Ford International Staff, Ford Motor Co.

● **"Management must become technically, as well as market, oriented. Product life cycles are becoming shorter and shorter—sometimes as much as 60 per cent of the goods on a dealer's shelves are obsolete. Market research must broaden its role; it must learn how to measure the excitement in the market. We must also find ways to get information faster and diagnose problems faster. Our present tools tell us when we are in trouble but don't do a good enough job of predicting. Management needs an 'early warning system.'"**
—**Peter G. Peterson,** executive vice president, Bell & Howell Co.

● **"The U. S. will become less competitive in the world market in standardized items. We'll remain keenly competitive and hold an edge in the industries that have aggressive research and development programs. The export manager is making the transition from an 'Orphan Annie' to the 'fair haired boy.'"**
—**George Donat,** manager, overseas market research, Parke, Davis & Co.

● **"Industrial suppliers will be tempted more and more into consumer markets. Expect more vertical integration. And look for industry's research and development spending to continue its sharp climb. More than ever before, the consumer is willing to take the risk of trying new products."**
—**D. Reid Weedon Jr.,** vice president, Arthur D. Little Inc.

Federal Highway Spending Could Hit $4 Billion Annually by 1970... Export Trade Promotion Program Blocked

ECONOMISTS close to the highway program are pleased with the increase in federal aid funds to states for highway construction. In fiscal 1961, states will get $2 billion for the interstate system; almost $875 million will be devoted to the regular "ABC" federal program of aid to the states. The federal government finances 90 per cent of the cost of the interstate system, 50 per cent of the ABC program. The states pay the balance.

After fiscal 1961, most observers expect the program to return to the "$3 billion-look" of fiscal 1959 (see chart). As originally charted in 1959, the program would require spending of $3 billion or more per year for eight years (fiscal 1960-67). With revised cost estimates, economists now see federal spending rising to the $4 billion-level before the end of the 1960s, if the interstate system is to be completed in the early 1970s. Plans come up for review by Congress next year when new cost estimates will be available.

● TRADE PROMOTION PROGRAM BLOCKED—Last week, the House Appropriations Committee refused to add $4.3 million for the highly touted export promotion program launched this spring by the administration as a partial answer to the threat of import competition. Almost $2 million would have gone to the Commerce Department, about $1 million each to the State Department and White House, and $500,000 to the Agriculture Department, mostly for salaries of additional trade experts.

Chances are that the program will be reinstated by the Senate, but the action of the powerful House committee cannot be overlooked. Crux: Congress expects the administration to come up with something more than lip service to the import problem.

● MINUTEMAN TRAIN PATROL TESTS—Test runs of trains which will carry the Air Force's Minuteman missile have begun at Hill Air Force Base, Utah. The idea is to get the same mobility as the Navy's submarine fired Polaris. If feasible, Minuteman trains will be constantly on the move around the country.

● NEW LOOK FOR RECIPROCAL TRADE?—Washington anticipates a showdown on our foreign trade program when the Reciprocal Trade Agreements Act comes up for renewal in 1962. More congressmen who are usually on the side of so-called free trade are becoming increasingly aware of a need to link the act with a domestic program to aid communities hard hit by foreign competition.

One Capitol Hill source told STEEL: "It is obvious the communities which benefit from exports most are not the ones most hurt by imports. So there is no balance in our foreign trade on the community level. It is useless to expect congressmen with a free trade record to vote for a simple extension of the trade act if his own community is starting to feel the pinch of import competition."

The situation is evident now. Sen. Paul Douglas (D., Ill.), an outstanding liberal, is reported to be facing a tough election this fall, partially because of the trade problem. It is paradoxical that many of the most liberal Congressional figures, particularly Democrats, come from the heavily industrialized states of the Midwest and East where foreign competition is hitting hardest.

● MORE HELP FOR DEFENSE MARKETERS—One of the most helpful guides to metalworkers interested in defense business is the "Synopsis of U. S. Government Procurement, Sales, and Contract Awards." Published Monday through Friday, it costs $10 a year and may be purchased through any Commerce Department office. New regulations require the synopsis to contain all proposed procurement, whether advertised or negotiated, if the amount exceeds $10,000. New regulations also require government buying agencies to "encourage" government contractors to publicize subcontracting opportunities in the synopsis.

A long diameter and the adjacent face of drive gears are precision ground on a CINCINNATI FILMATIC Angular Wheel Slide Grinding Machine equipped with automatic sizing and flagging combined.

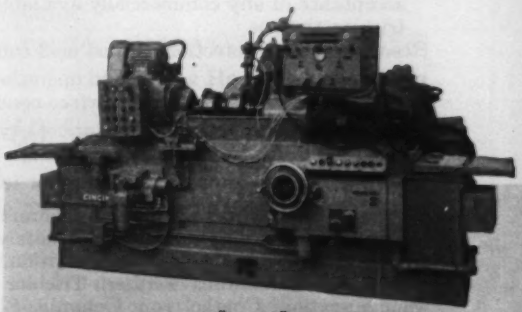
CINCINNATI GRINDING MACHINE DIVISION checks all the Angles . . .

to combine diameter and shoulder grinding operations profitably

Like other methods of machining, precision grinding operations often can be combined at a substantial saving in cost. Many factors must be considered, however, such as accurate wheel truing. Cincinnati Grinding Machine Division Specialists solved this problem in a unique and highly successful manner for angular wheel slide grinding.

The wheel is *automatically* trued to exact profile by merely pushing a button at front of the machine. A balanced hydraulic system assures sensitive, precise duplication of the cam contour in the wheel. Profile slide way is anti-friction; no twist; no stick-slip.

Combined diameter and shoulder grinding operations are analyzed from every angle by Cincinnati Grinding Specialists. These men have two wheelhead arrangements on which to base their recommendations—30° for diameters having a length considerably greater than the height of the shoulder, and 45° where height of shoulder equals or exceeds length of ground diameter. Complete details are in catalog G-686-1. May we send you a copy? **Grinding Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**



CINCINNATI FILMATIC 14"L x 36" Angular Wheel Slide Grinding Machine. These machines are also built in 6" and 10" swing sizes. Catalog No. G-686-1.

MMT-PE
Booth No. 1034

PRECISION GRINDING MACHINES: CENTERTYPE • CENTERLESS • MICRO-CENTRIC • ROLL • CHUCKING • CENTERLESS LAPPING

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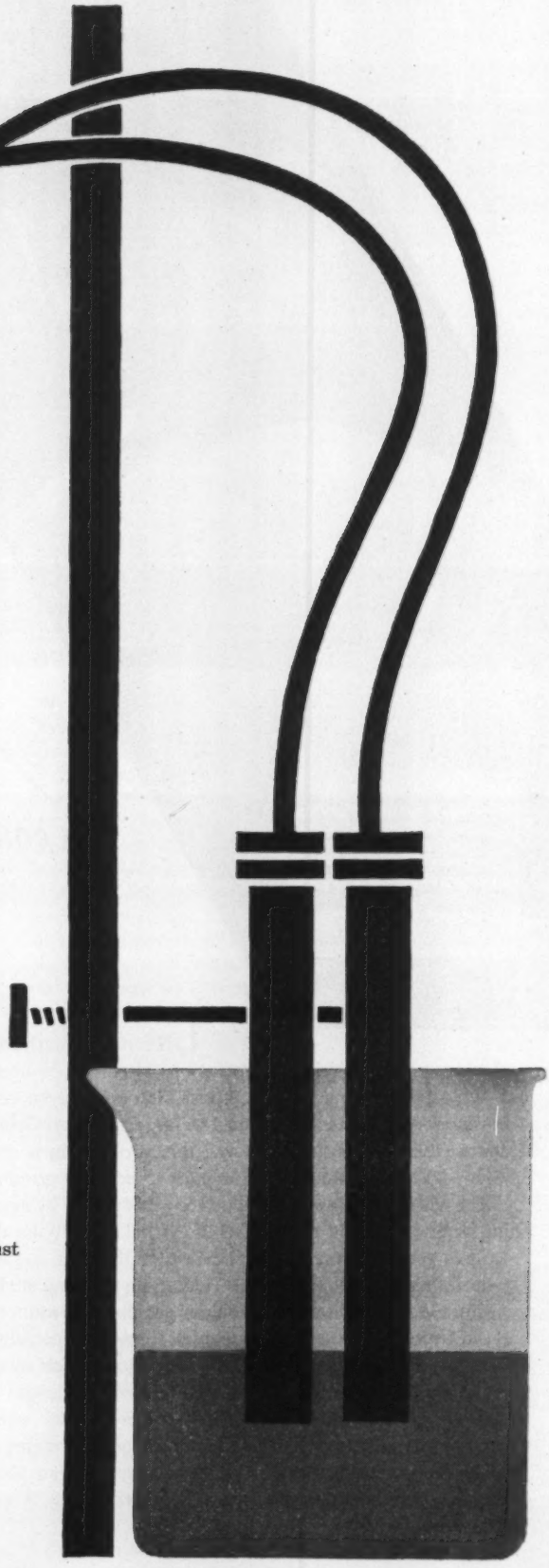
GRINDING MACHINE DIVISION



pH 7

some facts about the first truly neutral, high performance trichlorethylene

Columbia-Southern's improved Trichlor makes your job easier, your cleaning better and your costs lower.

Here are the facts:

Longer life and greater stability—proved by actual operation.
Result: Lower cleaning costs—more metal degreased per pound of Columbia-Southern Trichlor.

Rugged stabilization—helps prevent contaminant break-down.
Result: Lower maintenance costs—less sludge formation and longer operating time between clean-outs.

Alkalinity—closer to neutral than any other degreasing trichlorethylene.
Result: Better control in alkaline sensitive operations.

High acid acceptance—highest average acid acceptance of any commercially available trichlorethylene.
Result: Greater protection against acid contaminants.

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Result: More consistent metal surface conditioning.

Copper corrosion—none in hot or cold systems.
Result: No losses from copper tarnishing.

Compatibility—compatible with other trichlorethylenes.

Extensive field testing proves that Columbia-Southern's truly neutral trichlorethylene is adequately stabilized for the most critical degreasing operation. Want to see just how this new Columbia-Southern Trichlor can improve your operation? Contact your Columbia-Southern Representative.

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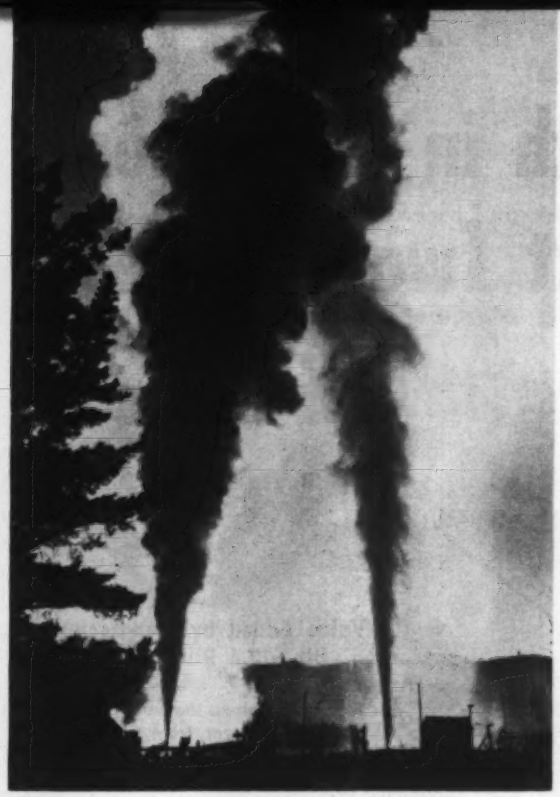


These thermal jets in New Zealand's ancient "Valley of Steam" are being harnessed to produce electricity

Natural Wonder Powers New Zealand Turbines

FOR CENTURIES, the Maori people of New Zealand have used a thermal wonderland in the Rotorua-Karerau-Wairakei region on North Island to provide constant hot water for cooking and washing. More recently, the white settlers of the town of Rotorua have enjoyed free hot water and central heating piped to their homes from underground springs. Now, the New Zealand government is using the hot water to generate urgently needed electric power to cope with the industrial expansion spurred by foreign investment and rising population.

A geothermal power station, designed to provide 69,000 kw, has been completed near Wairakei. Cost: $16 million. Hot steam exists at high pressures under the earth's crust in the volcanic region.

Bores, up to 8 in. in diameter and 500 to 3000 ft deep, were drilled. Pressures at the bore heads vary between 70 and 200 psi when discharging steam. The water which springs from the bores at above boiling temperatures is converted to steam to drive the turbines. A hot water collection system will be built to co-ordinate with the steam harnessing project now in use.

The noise problem, created by the water pouring through the bores under great pressure, was solved by attaching a series of concrete pipes of increasing dimension to the bore outlet.

The first stage of the Wairakei development is completed. Plans for a second stage to boost output to 151,000 kw are being pushed ahead. A third stage to raise output to 252,000 kw is also being planned.

Why a Licensing Agreement?

"Invisible" trade is gaining as more and more firms on both sides of the oceans are entering into licensing agreements with foreign companies.

For example: The German American Chamber of Commerce recently handled contacts between U. S. firms and 164 German companies—57 were interested in having their products manufactured or processed in this country and 107 sought similar arrangements for American products in Germany. The Chamber cites these advantages of licensing:

- Products manufactured nearer to markets eliminate transoceanic shipping, packing, and insurance charges.
- Licensees take care of labor problems and the myriad of details involved in operating a plant, including the selection of the best production resources.
- In choosing a licensee with an allied product, established distribution and sales facilities can be employed with a minimum of additional training.
- Complete manufacturing, promotion, distribution, and sales facilities can be established with a minimum of capital.
- Licensees often look for partners with products that can put surplus plant space and productive capacity to profitable use.

The chamber notes two key advantages to U. S. firms with licensing agreements overseas:

Production costs are lower, making products competitive in new markets.

Many foreign countries don't have restrictions on the transfer of royalties.

U. S. firms also enjoy tax advantages in many foreign countries.

Britain's '60 Soars

Pressure for steel in the British market continues at a high level; many consumers are faced by delays in deliveries.

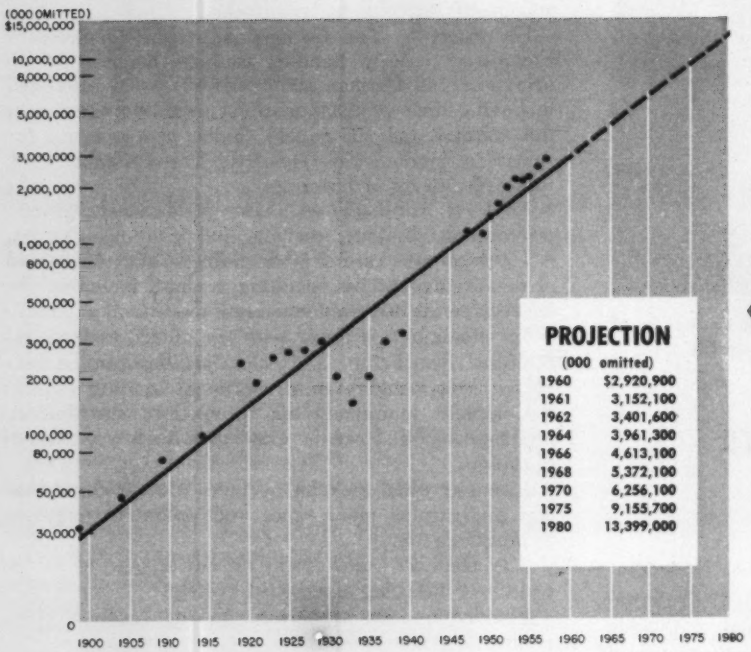
Significant note: Britain's steel imports reached 392,000 tons in the first four months of 1960 vs. 162,000 tons in the corresponding period of 1959. Sheets for the booming auto industry are the No. 1 import; imports of semifinished steel are also on the rise because of the rapidly expanding demands of the rerolling industry.

The re-equipment of industry has given a powerful boost to the steel industry. Approved projects for new factories and additions are almost double what they were in the comparable period last year.

Machinery orders are 15 per cent above 1959's on the export front and 11 per cent at home. Auto exports are running 40 per cent ahead of last year's.

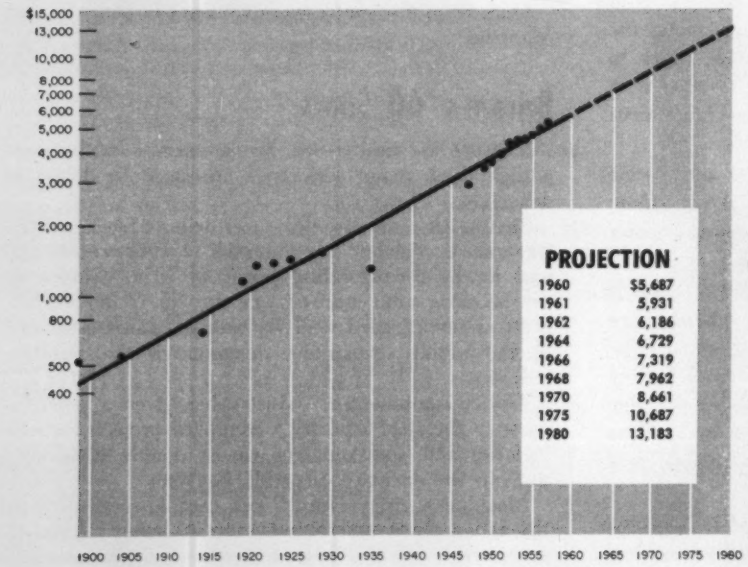
PROJECT 1980

Big Growth in Instruments Over Next Two Decades



Value Added by Manufacture to Hit $13.4 Billion by 1980

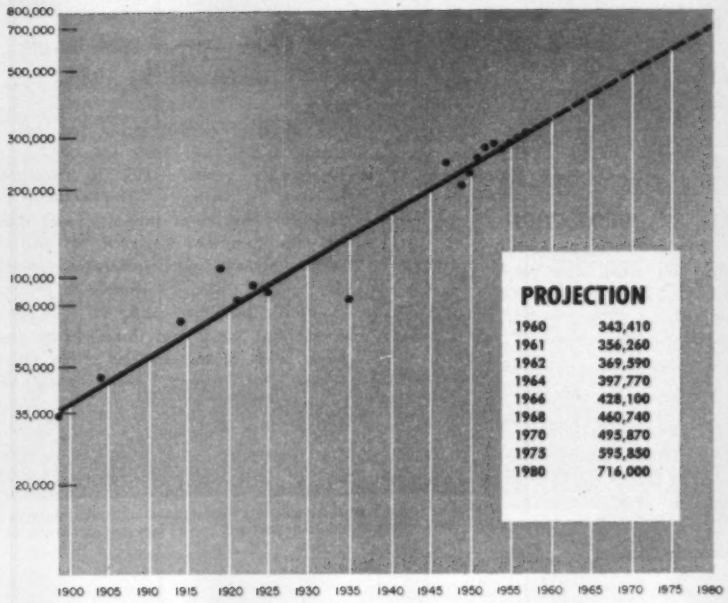
This chart shows the value added for each census year from 1899 through 1957. The dots in this and succeeding charts indicate the actual figure for each survey year. The line is the trend. Dots are missing for World War II years in all charts because surveys were discontinued then for security reasons. Dollar figures in this and other graphs are unadjusted, and the projections include estimates for future inflation.



All Employees' Average Annual Earnings Will More than Double

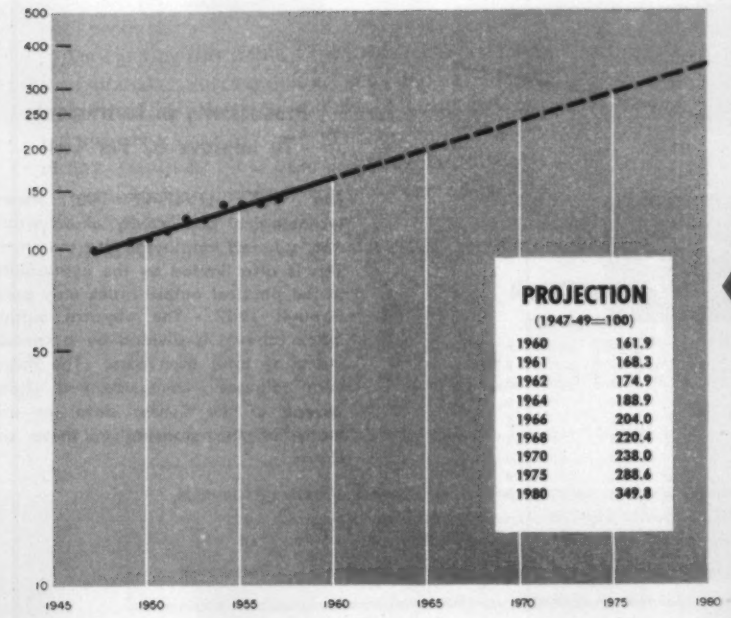
This chart is derived from corresponding census data for total wage and salary compensation and the total number of employees. Economic productivity, or the yearly ratio of value added by manufacture (above) to total earnings in instruments, has been nearly constant at the $1.72 average for 1947 through 1957. This illustrates the Rucker Share of Production Principle, and it shows that the employee's share of production for instruments, taken as a whole, is 58.3 per cent of the values created and that the company's share averages 41.7 per cent.

Value added by manufacture will be almost five times greater in 1980 than this year. Employment will more then double. Productivity will climb sharply. Those are some of the probabilities projected for Standard Industrial Classification Group 38 (instruments and related products) by Eddy-Rucker-Nickels Co., management consulting firm in Cambridge 38, Mass. This is the second of six metalworking growth studies prepared for STEEL



Employment Will Reach 716,000 Within 20 Years

This charts both hourly and salaried employees for each census year from 1899 through 1957. The formulas for the trend line in these first three of the six instrument industry charts have been developed from 58 years of background as a base for projections. Experience shows that established growth trends change slowly, if at all. But actual conditions in any future year may fluctuate above or below the trend. So all six of these projections represent probabilities, not precise predictions.

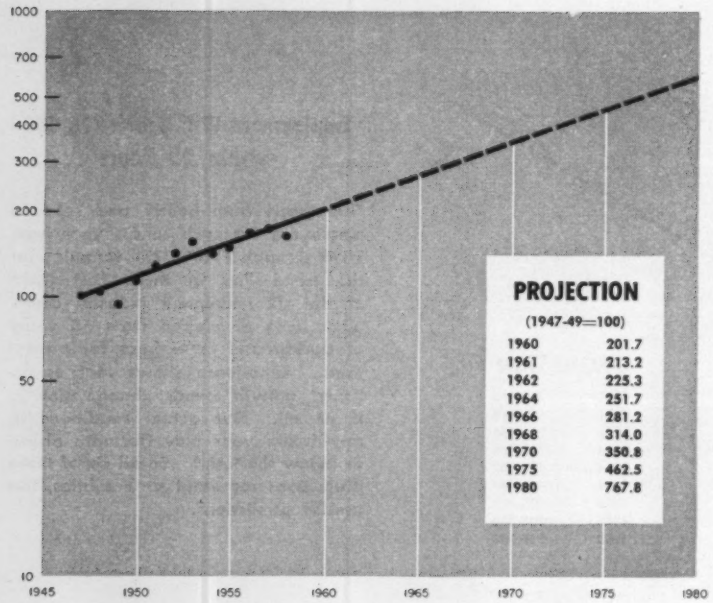


Instrument, Related Equipment Prices May Double

This is a synthetic price index because no wholesale product price analysis for instruments is available from government sources. It's derived this way: Set up an index for value added by manufacture, using 1947-49 as the base of 100. Then divide that by the corresponding Federal Reserve Board index of industrial production for instruments. The resulting index reflects the inflation likely for SIC Group 38.

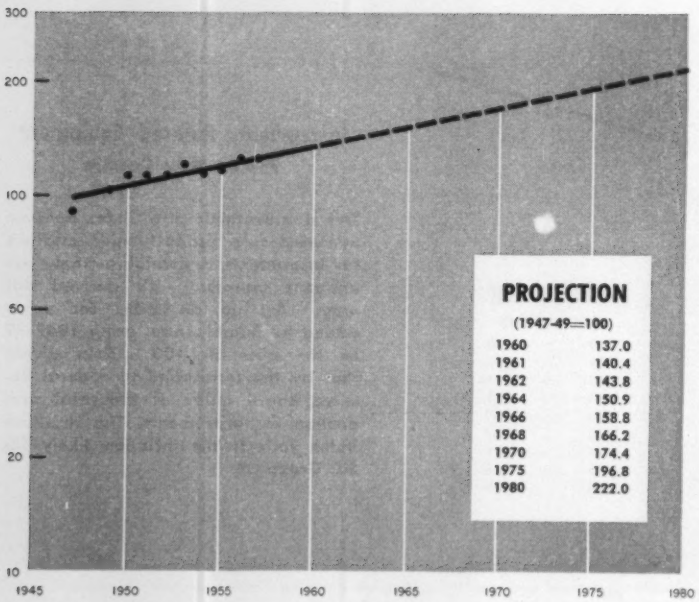
PROJECT 1980

• An extra copy of this or the first article in the series (STEEL, June 13, p. 122) is available. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. By using material like this, you may win $1000. For details, see Pages 5 and 6. On July 11, STEEL's "Project 1980" will be a study of the primary metals industry.



Physical Output Will Nearly Quadruple by 1980

The physical output index for instruments is only available for 1947 and succeeding years. FRB is currently revising its index. The revision is available for total industry, but thus far the complete revision for instruments hasn't been published. With this limited data, it's chancy to project to 1980, but the ratios on the look ahead for these last three charts jibe well with those in the first three where the figures went back 58 years.



Productivity in Instruments To Improve 62 Per Cent

This index (1947-49 = 100) shows technological productivity of all wage and salaried employees per manyear. This is also limited by the availability of the physical output index only back through 1947. The physical output index (above) is divided by a special index of total manyears. The manyear figures were derived from Bureau of the Census data, as are many of the statistics in these six charts.

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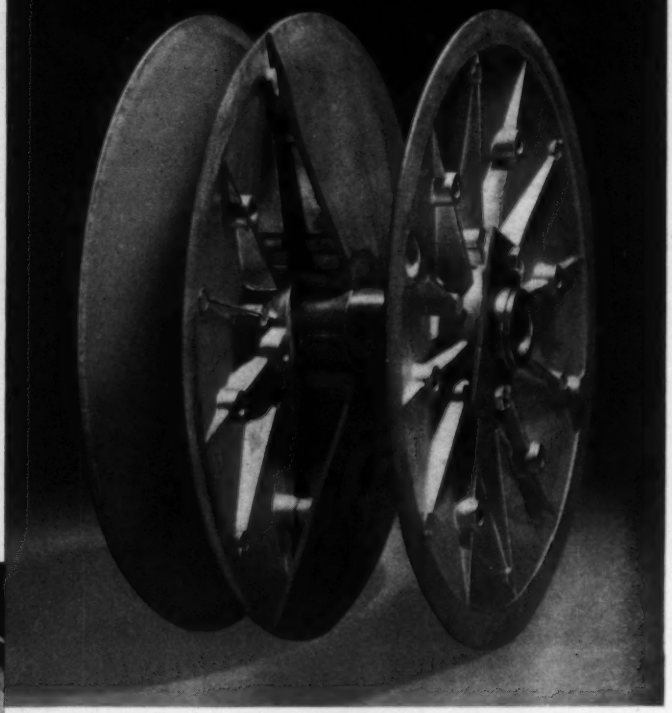
WITH HIGH STRENGTH THIN-WALL SECTIONS

WHEN DIE CAST WITH ZAMAK



A single zinc die casting—a conical disk 7½" in diameter—used in four different positions, makes up this speed changer mechanism for the General Electric Combination Washer-Dryer.

Cast with hub and radial reinforcing ribs and a projection-recess interlocking system (see view above, with one disk cut away to show cross section) two of these parts are pressed, back to back, on a bronze bearing to form a movable drive ratio adjustment. Two single pieces, locked on the ends of the tube, complete the dual-pulley assembly.

In position 1 (at left), the mechanism provides a regulated low speed for washing, rinsing and drying cycles. Moved upright, as in position 2, the drive is changed from an 8 to 1 ratio for centrifuging speeds during the water-extracting cycle.

Zinc die castings, because of their high strength in thin-wall sections, their dimensional accuracy, smooth surface and low cost, are the logical and obvious answer to the problem of producing these heavy-duty appliance parts.

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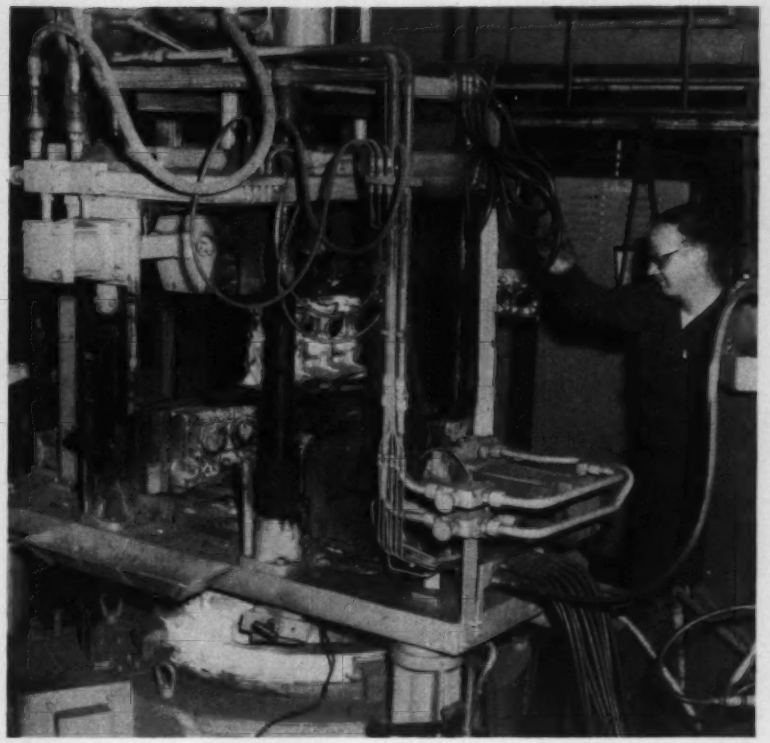

Low pressure casting technique highlights . . .

Cast Corvair Parts

Diecast

Flywheel housings
Crankcase covers
Idler brackets
Oil cooler adapters
Transmission stators
Clutch housings

Gravity Fed Permanent Mold

Pistons
Camshaft gears

Low Pressure Permanent Mold

Crankcases
Gear engine housings
Oil filter adapters
Heads

How Corvair Engine Parts Are Cast

AFTER A YEAR of operation, Chevrolet Div., General Motors Corp., has opened its $18 million aluminum foundry at Massena, N. Y., to show how it casts parts for its Corvair engine.

Feature of the new plant is its low pressure casting facilities. GM officials say this is the first such installation in this country. Employed for several years in Europe, low pressure casting was originally developed in England, later refined as the Carl Schmidt process in Germany.

• **How It Works**—The permanent mold machines are designed to fit over a closed furnace that holds the molten aluminum. A ceramic coated tube feeds up from the bottom of the furnace into the die cavity. Air pressure up to 10 psi is applied to the surface of the metal in the furnace, pushing the molten aluminum up the stalk and into the die. After the metal solidifies, the air pressure is released, the mold opened, and the casting ejected.

In this process, the metal hardens from the top down. That makes for greater density, controlled shrinkage, and less porosity, say the engineers. It also means molds can be designed for simple gating since the metal will feed through narrow areas and into larger cavities without chilling.

Average scrap rate for the plant is 3.5 per cent. Metal yield runs about 96 per cent. The low pressure equipment costs about as much as gravity fed, permanent mold machines and operates at

These Car Keys . . .

. . . (And the car to go with them) could be yours for two weeks. Flip the pages back to the Servicenter, Page 5, and send in the coupon you'll find there.

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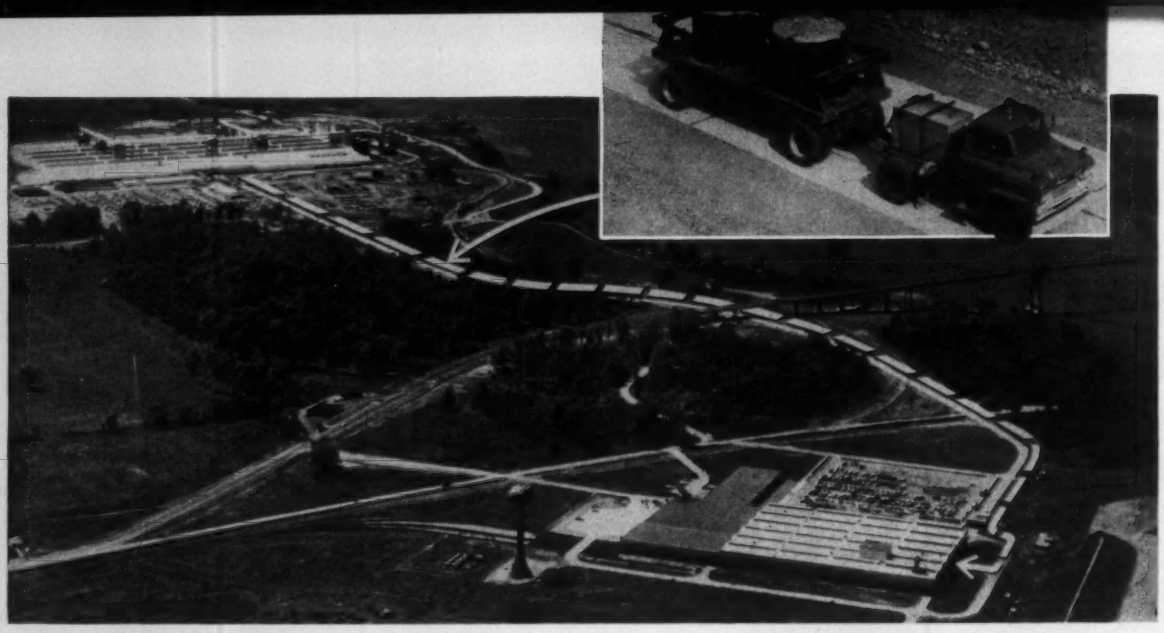

Shuttling Molten Aluminum . . .

Molten aluminum is trucked in two, 9000 lb crucibles (at 1600° F) from Reynolds Metals Co.'s $88 million facility (left) over a private road to the GM plant. The metal is then poured into 30,000 lb holding furnaces. The Reynolds facility has three potlines (504 reduction pots) with a rated capacity of 200 million lb annually. It has a 33 year contract with the New York State Power Authority for 27 per cent of its St. Lawrence hydroelectric power output at a rate of about 0.4 cent per kilowatt-hour. Only a third of the Reynolds aluminum capacity can go to Chevrolet under the molten metal contract.

slightly higher production rates.

• **Intricate Part** — Cylinder heads with their narrow cooling fins, are the most intricate castings. Heads are cast in 36 machines, 24 in one line and 12 in the second. Another battery of 12 machines will be added to the second line next year. Each machine is fed by a 2200 lb furnace. One man operates four machines, one of which is held on standby. Cycle rate for each machine is 7.75 minutes. Rough cast heads weigh 16.5 lb. Only a single gate weighing less than 3 ounces must be removed from the casting.

This part is cast in semipermanent molds. Exhaust ports and inlets require solid cores blown from resin bonded, furfural-urea, wet sand mix using a GM developed catalyst. Since the furfural-urea mix generates core gas quickly, the machines on these two head lines are equipped with an evacuation system which evacuates air in the mold to −6 psi so the gas will be sucked out. The head machines were built in Germany. All hydraulic and electrical controls were installed here, however, because GM has adapted the machines to automatic cycling so one man can service several machines.

• **Other Methods**—In addition to the low pressure machines, Massena has ten diecasting machines ranging in capacity from 800 to 400 tons. Each operator is responsible for trimming his own castings in a hydraulic trimmer set up behind his work position. Each operator also is responsible for quality of the castings coming from his machine.

Chevrolet also is setting up three, automatic, rotary pressure, casting machines to cast pistons. Each machine can turn out 600 pistons an hour. The machines will be in operation for 1961 production.

• **Metal Processing** — The plant receives metal on a seven day a week schedule. It casts on a five day, three shift basis (two shifts for diecasters).

The aluminum is trucked from Reynolds to the foundry in two, 9000 lb crucibles at about 1600° F. While it's still on the truck, it undergoes a chlorine flux to deoxidize it. The metal then is dumped into fourteen 30,000 lb holding furnaces where it's maintained at 1400 to 1500° F.

U. S. Auto Output

Passenger Only

	1960	1959
January	688,731	545,756
February	659,323	478,518
March	654,242	576,080
April	582,909	578,846
May	611,226	546,817
5 Mo. Totals	3,196,431	2,726,017
June		557,995
July		555,410
August		239,149
September		258,151
October		507,527
November		254,527
December		494,931
Total		5,593,707

Week Ended	1960	1959
May 21	154,755	133,568
May 28	142,359	117,372
June 4	115,068	125,186
June 11	139,423	127,029
June 18	137,721†	129,270
June 25	140,000*	127,217

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

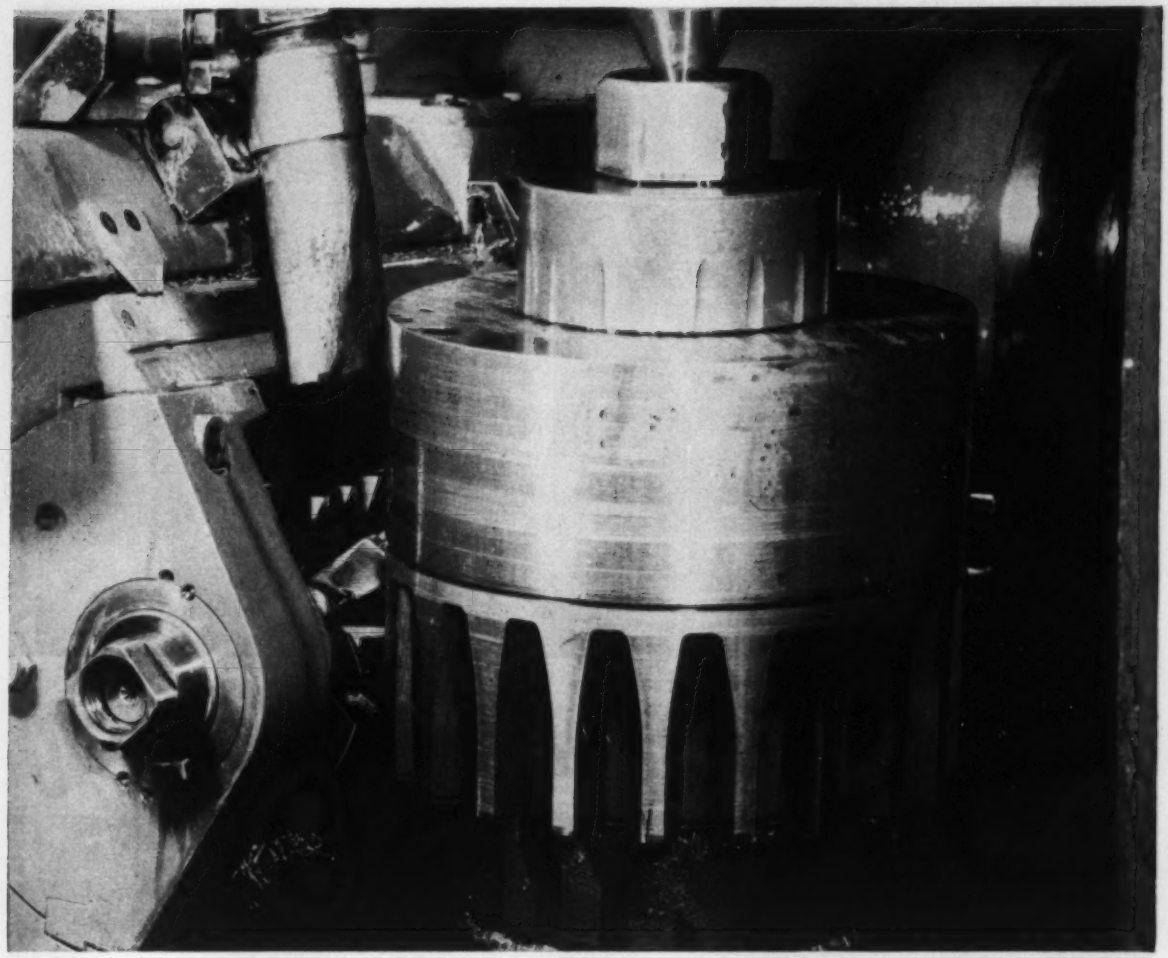

Photo courtesy Boston Gear

Aristoloy Leaded increases hob speed 50% . . . prolongs tool life 50% for Boston Gear

Together these add up to 100% satisfaction with Aristoloy Leaded* steel. By switching to Aristoloy Leaded, Boston Gear now machines three 7" Spur Gears per hour. Best production achieved on the steel previously used was two per hour.

With Aristoloy Leaded, 24 gears are cut before the hob needs sharpening . . . only 16 were possible with other steel used by Boston Gear.

Strength and hardness of the finished part show no detectable difference in physical properties from the unleaded steel used earlier.

For complete information about Aristoloy leaded or standard analyses carbon, alloy, and stainless grades, write for booklet entitled, "A Complete Line of Leaded Steels," and new Products and Facilities Catalog.

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RB&W fastener survey uncovers use of special item which is replaceable by standard hex screw at much less cost

Of course you pay more for a "special" than a "standard" item—and that includes fasteners. So, when surveying a company's usage of fasteners, the RB&W Man looks sharply for the "specials"—and a valid reason for their use.

He could find no good purpose for the extensive use of screws with heavy head and milled body in one particular product. There was neither a specification requiring close fit in very close tolerance holes . . . nor were there exceptionally "sloppy" holes that called for an oversize head to span.

He therefore recommended assembly with standard RB&W High Strength Hex Screws. They would meet any physical requirement for the "special" being used... *but cost 30¢ less per unit.* Yearly total: $4500 more for *profits* instead of *costs.*

Are you *sure* you're not needlessly wasting dollars on fastener specifications? Let the RB&W fastener expert survey them. He's made proper fastener usage a science, is ready to cooperate with your engineers. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

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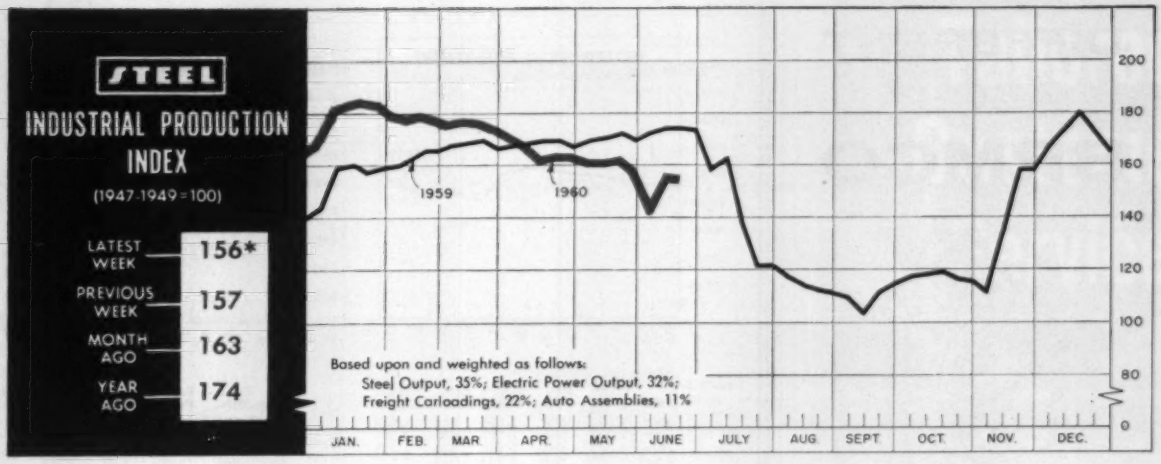


*Week ended June 18.

Summer Employment Records Assured

RECORD SHATTERING employment combined with higher wages will go a long way toward keeping the nation's economy on a firm basis through the summer months. The current employment figure has been exceeded only two times, and before the summer is over, both peaks will be surpassed.

But the decline in manufacturing payrolls (characterized by metalworking as charted on Page 64) is likely to continue until the expected pickup in production activity in the fall.

● **Precedent** — Employment records are broken so frequently that they are expected. The real news is made when they aren't broken. The summer months are critical in this regard. Here is why: In the postwar years, the civilian labor force has peaked in July nine times out of 13. Only once has the top come as early as June. It came in August three times. On the other hand, total employment has topped out in August in seven of those years, in July five times, and in June just once (1952).

The labor statistics for May (the latest month for which data are available) were the best on record for that month. The work force was 70,667,000, just 670,000 shy of the all-time peak in July, 1959. Total civilian employment was 67.2 million, just shy of the record June-to-August level last year and only fractionally under the previous peak set in July, 1957.

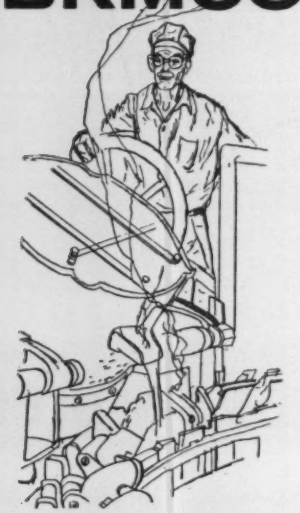
● **How Much and When?**—On the basis of historical trends, it seems that only a complete collapse of the economy within the next two months could sidetrack the march to new peaks. (That definitely is not anticipated.) In the postwar period, the average increase in the civilian work force from May to the peak is 1,993,000 persons. That would result in a total of almost 72.7 million this summer, far above any previous total. For the employment data, the average increase from

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,739[1]	1,775	2,486
Electric Power Distributed (million kw-hr)	13,600[1]	13,766	13,331
Bituminous Coal Output (1000 tons)	8,730[1]	8,010	9,124
Crude Oil Production (daily avg—1000 bbl)	6 775[1]	6,772	7,017
Construction Volume (*ENR*—millions)	$583.2	$482.0	$556.8
Auto, Truck Output, U. S., Canada (*Ward's*)	172,653[1]	174,274	167,438
TRADE			
Freight Carloadings (1000 Cars)	650[1]	648	720
Intercity Truck Tonnage (changes from year ago)	−3.1%	−14.5%	+12.6%
Business Failures (Dun & Bradstreet)	283	274	295
Currency in Circulation (millions)[3]	$31,976	$31,917	$31,873
Dept. Store Sales (changes from year ago)[3]	+2%	−13%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$26.531	$26.114	$27.391
Federal Gross Debt (billions)	$289.2	$289.3	$286.3
Bond Volume, NYSE (millions)	$25.1	$28.9	$26.2
Stocks Sales, NYSE (thousands of shares)	17,701	17,506	13,125
Loans and Investments (billions)[4]	$102.6	$102.9	$102.6
U. S. Govt. Obligations Held (billions)[4]	$25.6	$25.8	$31.0
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	247.82
STEEL's Nonferrous Metal Price Index[6]	231.8	231.8	222.1
All Commodities[7]	119.6	119.6	119.4
Commodities Other than Farm & Foods[7]	128.3	128.3	127.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1960, 2,849,306; 1959, 2,831,846. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

WHAT'S
DIFFERENT
ABOUT
BRMCO



If you buy aluminum, brass or bronze in strip and rolls, you may think all suppliers are alike. They're not. No one supplier can be all things to all people, and few try. If you are the type of buyer who looks for something a little "extra" in quality, workability and service, you might make it a point to learn more about BRMCO. With BRMCO metals, uniformity of width, gauge and grain size results in greater efficiency and lower metal working costs. For example, BRMCO can hold temper tolerances to within plus or minus 3 points on the Rockwell scale.

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The man from BRMCO can tell you the rest of the story, including information on our own special alloys for unusual requirements.

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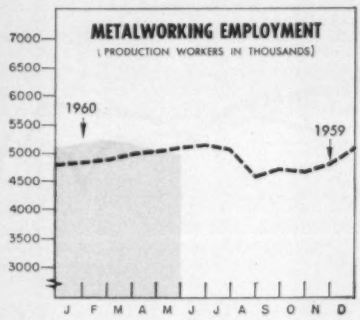
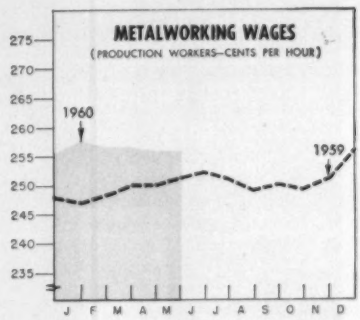
Subsidiary of Atlantic Coast Industries, Inc.
FINE QUALITY ALUMINUM, BRASS AND BRONZE IN STRIP AND ROLLS

THE BUSINESS TREND





1959	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
May	1,051	853	1,153	814	1,233
June	1,067	866	1,167	833	1,224
July	1,038	847	1,149	836	1,207
Aug.	628	815	1,138	849	1,132
Sept.	611	841	1,167	888	1,200
Oct.	602	812	1,147	893	1,208
Nov.	975	800	1,136	882	1,026
Dec.	1,039	841	1,166	892	1,172
1960					
Jan.	1,048	857	1,179	892	1,239
Feb.	1,052	863	1,191	890	1,245
Mar.	1,043	954	1,186	879	1,221
Apr.	1,019	836	1,177	860	1,183
May	986	830	1,162	848	1,170

U. S. Bureau of Labor Statistics.
Charts copyright, 1960, STEEL.

1959	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
May	284	237	250	221	264
June	284	238	250	222	266
July	281	237	250	222	266
Aug.	264	238	250	222	269
Sept.	266	239	251	223	271
Oct.	265	236	252	224	270
Nov.	277	236	252	224	267
Dec.	285	241	254	227	273
1960					
Jan.	287	244	255	228	276
Feb.	286	243	255	228	275
Mar.	285	242	256	228	273
Apr.	285	242	255	227	271
May*	280	243	256	228	274

*Preliminary.
U. S. Bureau of Labor Statistics.

May to the peak in the 13 years has been 1,783,000. That gain would result in total employment of 68,991,000 sometime this summer. If that sounds overoptimistic, consider this possibility: The smallest May-to-peak gain since 1947 would yield a top employment of 68,401,000 this summer compared with the record of 67,594,000 during last July.

The May statistics indicate that this will be a fairly normal year as far as the total work force goes. So you might expect the peak to show up in August. But it is likely that top employment will come in July instead of August because of the slowdown in manufacturing, which accounts for about 18 per cent of total civilian employment.

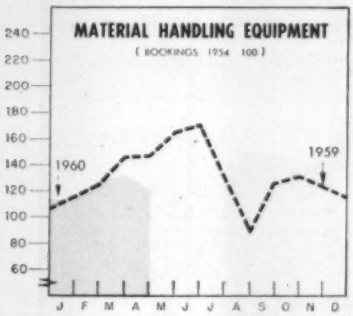
• **More Spending**—If wages do no worse than hold steady with the May level, the increase in employment will mean a significant boost in personal income. Last month, average weekly earning in manufacturing advanced to $90.74, nearly $1 above the April figure and 42 cents above the year-ago total. While the hourly wage held steady, the average workweek advanced from 39.4 hours to 39.8 hours. It does not seem realistic to expect the workweek to continue its uptrend through the summer, but an increase in average earnings does appear likely as more new wage contracts are negotiated.

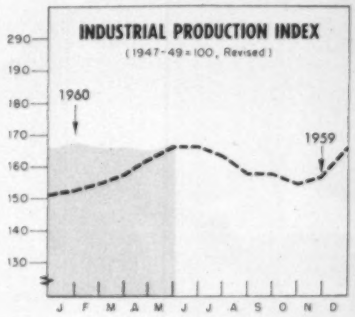
This will keep intact the steady upward climb in total personal income. Last month, the annual rate, seasonally adjusted, was $399.5 billion, about $1.5 billion higher than in April. With the outlook for fairly stable prices (the wholesale price index dropped 0.3 percentage point in May—a change that should be reflected later this year in the consumer price index), this could mean further strength in personal consumption expenditures.

Canadian Industry Steady

Industrial activity in Canada is holding to the steady course of the last few months, and there is no sign of a break, either up or down, in the near future. The latest survey of the Canadian Association of Purchasing Agents reveals that new orders remained at the month-ago level for 53 per cent of the reporting companies, while 28 per cent reported an increase, and 19 per cent noted a decline.

Production reports were similar: Unchanged for 57 per cent, up for 24 per cent (the lowest figure since





	1960	1959	1958	1957
Jan.	114.96	115.84	93.07	126.34
Feb.	128.74	124.77	93.49	139.29
Mar.	133.60	146.36	97.89	140.76
Apr.	122.41	147.28	122.36	132.67
May	.....	164.45	118.04	157.95
June	.....	170.72	131.15	121.57
July	.....	130.26	134.34	128.31
Aug.	.....	87.02	104.46	110.09
Sept.	.....	126.43	85.41	116.79
Oct.	.....	131.09	111.35	124.80
Nov.	.....	124.16	110.88	87.80
Dec.	.....	113.78	105.97	105.65
Avg	...	131.85	109.87	124.34

Material Handling Institute Inc.

(Seasonally adjusted)

	Total Production 1960	Total Production 1959	Total Mfg. 1960	Total Mfg. 1959	Durables Mfg. 1960	Durables Mfg. 1959
Jan.	168	152	168	150	181	156
Feb.	166	155	166	153	178	160
Mar.	166	157	165	156	175	165
Apr.	165	162	164	161	172	170
May	167*	166	166*	165	175*	177
June	...	166	...	166	...	178
July	...	163	...	163	...	171
Aug.	...	157	...	156	...	158
Sept.	...	157	...	156	...	157
Oct.	...	154	...	153	...	155
Nov.	...	155	...	154	...	155
Dec.	...	165	...	164	...	174
Avg	...	159	...	158	...	164

Federal Reserve Board. *Preliminary.

last November), and down for 19 per cent. Employment was down slightly in May.

Summer Doldrums Set In

STEEL's industrial production index continues to lack zip, and prospects for a significant upturn before fall are fading.

At the moment, there is little hope for a pickup in steel production before August. But the operating rate seems to be firm at a little above 60 per cent of capacity.

The auto industry, with high stocks, is not likely to increase its schedules despite a five year high in sales. In fact, labor difficulties and inventory adjustments are causing some downgrading of June output, and the phaseout of 1960 models will start in July.

Railroad freight carloadings may show a decline in the near future. Several Great Lakes steamship companies are laying up ore boats because of the decline in steelmaking, and plant vacation schedules are causing a slowdown in shipments of metalworking products. James M. Symes, chairman of the Pennsylvania Railroad, one of the largest freight haulers, predicts that his line's third quarter volume will be lower than it is in the current three month period.

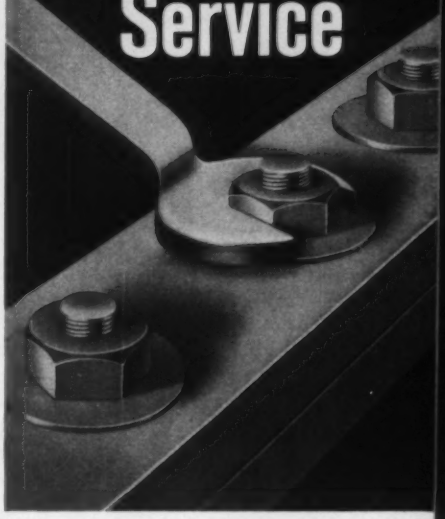
The only segment of the index which will show strength this summer is output of electricity. It will climb to its customary peak during the heat waves which usually appear in August, then settle back in early fall. But it will not have sufficient carrying power to lift the index out of the summer doldrums. It can merely minimize the decline.

Industry Reports

- Sales of industrial material handling equipment in April fell more than 11 points from the March level (see graph and table above).
- Members of the National Industrial Distributors' Association reported a decline in sales of 0.7 per cent in May compared with April.
- Orders of new railroad freight cars in May totaled 2234 compared with 5551 this April and 5203 in May, 1959. Shipments rose to 5931 cars against 5579 this April and 3358 in May, 1959.
- Despite declines in April, production of both radios and TV sets during the first five months is well ahead of the pace in the corresponding 1959 period.

News for
HEAVY INDUSTRY...

Tailored Customer Service



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- **tailored** product verification . . . every heat verified in our own laboratories
- **tailored** design recommendations . . . to your application requirements
- **tailored** order service and handling . . . geared to your production schedules
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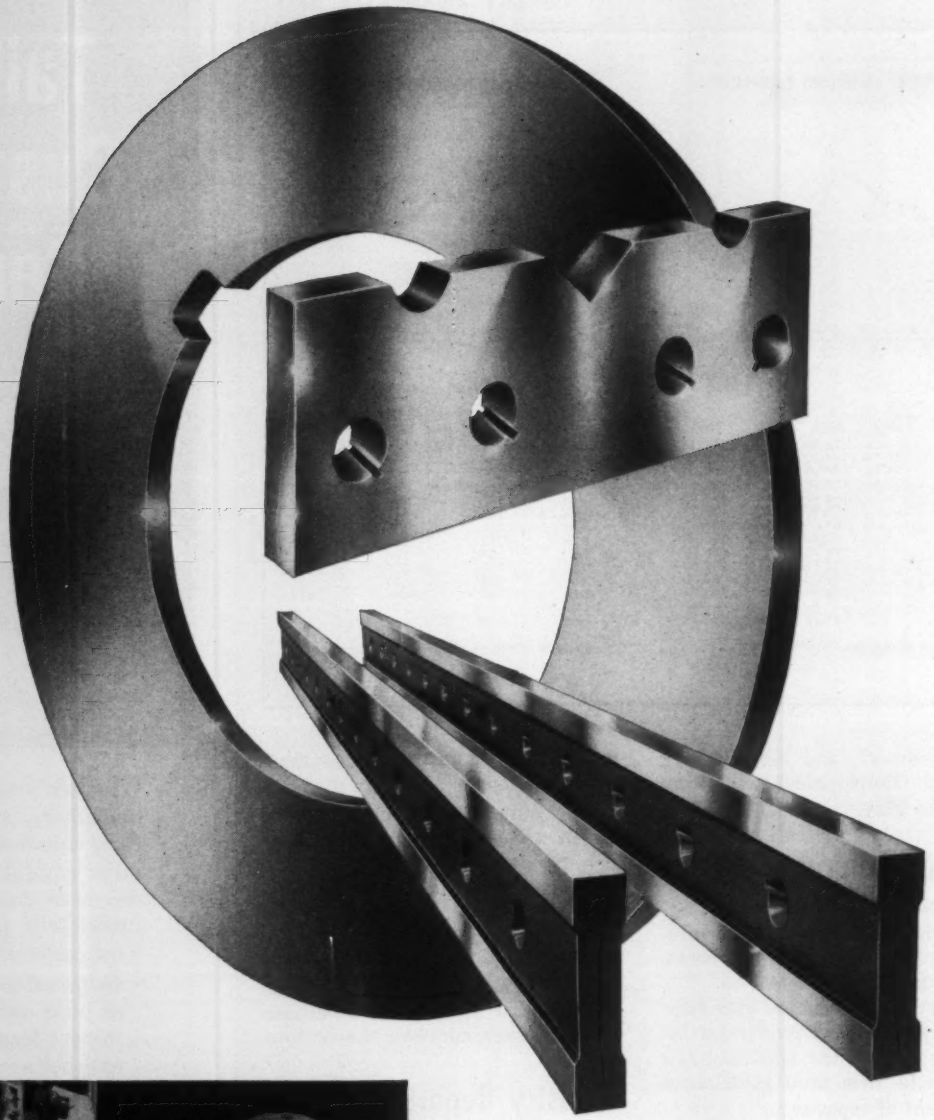

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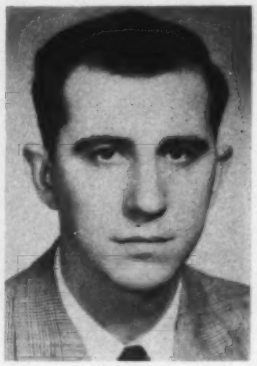
Vickers corporate eng. mgr.



THOMAS E. BAN
McDowell v. p.-research

ROBERT S. KAHN
joins Luria Bros. & Co.

HUGH C. BREAM
Western Design pres.

Duncan B. Gardiner was appointed manager-corporate engineering for **Vickers Inc.**, Detroit, division of Sperry Rand Corp. He was director of research and development.

Thomas E. Ban was elected vice president-research of **McDowell Co. Inc.**, Cleveland. Mr. Ban, who joined McDowell in 1955 as director of research, is responsible for operation of the company's Dwight-Lloyd Research Laboratories—applied minerals processes reseach which includes sintering and iron smelting pilot plants.

Merritt B. Sampson, director of engineering, **S-P Mfg. Corp.**, Solon, Ohio, was elected vice president-engineering. **Richard E. Sutherland**, sales manager and assistant to the executive vice president, was elected vice president-sales.

Harold G. Warner, recently made general manager of Cadillac Motor Car Div., was elected a vice president of **General Motors Corp.**, Detroit.

Fluor Corp. Ltd., Los Angeles, appointed **Ernest Moncrief** to the new post of vice president-co-ordinator of foreign operations and affiliates. He was vice president of the Mid-Continent Div., Houston. **James P. Wiseman**, former president of Fluor Products Co., succeeds Mr. Moncrief.

Douglas T. Abbott was made vice president and assistant general manager, **Columbian Bronze Corp.**, Freeport, N. Y. He was vice president-sales and engineering.

Robert S. Kahn joined **Luria Bros. & Co.**, New York, as vice president in charge of alloys and nonferrous metals for the company and its subsidiaries. He has headquarters in the Pittsburgh office. He was a vice president of Tube City Iron & Metal Co., Glassport, Pa., in charge of nonferrous metals.

Walter F. Helfrich was made general manager, **Thau Screw Products Inc.**, St. Louis. He was purchasing agent, Alco Valve Co.

Gilbert C. Strubell, plant manager, Torrington Div., was made administrative director of metallurgy and research for **American Brass Co.**, Waterbury, Conn. He is succeeded by **Lucius H. Bassett**, former works manager of Anaconda Aluminum Co.'s plant at Terre Haute, Ind. Changes are effective July 1.

Fred L. Sharpe Jr. was made vice president and director of sales, **Heresite & Chemical Co.**, Manitowoc, Wis. He was general manager of the subsidiary, General Coating Inc.

David M. Diltz was made automotive sales manager for **American Metal Products Co.**, Detroit.

Bruce S. Old was named senior vice president, **Arthur D. Little Inc.**, Cambridge, Mass. He was a vice president.

Leonard H. Sence was made chief engineer, **Bruce R. Lipe** assistant chief engineer, Centrifugal Pump Dept., Norwood, Ohio, Works, **Allis-Chalmers Mfg. Co.**

Hugh C. Bream was named president and general manager of **Western Design**, Santa Barbara Airport, Goleta, Calif., division of U. S. Industries Inc. Former manager of Western Design's Santa Barbara Div., he succeeds **C. W. Sponsel** who recently resigned to pursue personal business interests.

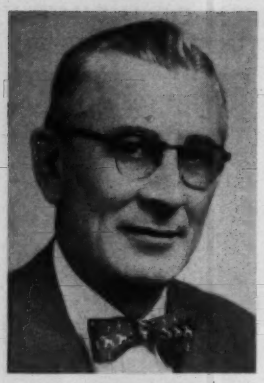
Clarence E. Killebrew was elected president, **Canadian Clark Ltd.**, St. Thomas, Ont., succeeding **George Spatta**, now chairman. Mr. Spatta is president of Clark Equipment Co., parent firm at Buchanan, Mich., and Mr. Killebrew is a vice president and general manager of its Construction Machinery Div. Canadian Clark also elected **Ronald J. Smith** (plant manager) a vice president, and **John A. Meyer** (plant controller) assistant secretary.

Michael DePiano was made sales manager, Valve & Fitting Div., **Cooper Alloy Corp.**, Hillside, N. J. He succeeds **Clayton L. Heintz**, who has established a sales agency and will represent the division in the Philadelphia area.

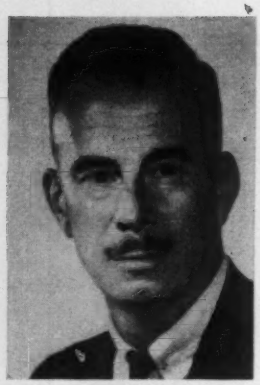
Douglas Tool Co., Detroit, appointed **Steve Herzina** sales manager.

Nicholas Kowall was promoted to technical director, **Pratt & Letchworth Div.**, Buffalo, Dayton Malleable Iron Co. Inc. He is succeeded as foundry superintendent by **Harold E. McMaster.**

P. Eugene Laliberte was made director of marketing, Electronics Div., **Stromberg - Carlson Div.**,



OTTO SVOBODA
Fairfield Eng. div. sales



CLIFFORD J. GRUBE
Texas Instruments sales post

JOHN C. WESTON
Gisholt production mgr.

JACK L. SCHUMANN
Buell Eng. president

Rochester, N. Y., General Dynamics Corp.

Otto Svoboda was made sales manager, UnitHandling Div., **Fairfield Engineering Co.**, Marion, Ohio. He was sales manager, May-Fran Engineering Inc., Cleveland.

D. Robert Beard was made Philadelphia district sales manager, **Wheeling Steel Corp.**

G. E. Rhodes was appointed vice president and general manager, **Taylor & Gaskin Inc.**, Detroit. For the last five years, he was vice president-general manager of the subsidiary, Indiana Bridge Co., Muncie, Ind. He previously served American Bridge Div., U. S. Steel Corp., for 25 years. **Hobart E. Wray** was made general manager at Indiana Bridge, and **George H. Parker** assistant general manager.

Daniel B. Lamb was made manager, Detroit Div., **Oakite Products Inc.**, succeeding **Thomas R. Smith**, retired.

Clifford J. Grube was made manager of field sales, **Texas Instruments Inc.'s** Metals & Controls Div., Attleboro, Mass. He was Eastern regional manager for the division. He succeeds **Robert A. Schultheiss**, named merchandising manager for the division.

John C. Weston was named production manager, **Gisholt Machine Co.**, Madison, Wis., to succeed **Woodbridge Bissell**, retired. Mr. Weston was chief inspector.

Herbert W. Wrozina was named factory manager for **Wheatland Metal Mfg. Co.'s** new Carnegie, Pa., plant. He was superintendent of maintenance for National Electric Div.'s Ambridge, Pa., plant, H. K. Porter Company Inc.

W. C. McDonald was named chief engineer, Marine & Industrial Engine Div., **Chrysler Corp.**, Detroit. He succeeds **H. D. Peacock**, resigned. Mr. McDonald was resident engineer of the Chrysler Mound Road engine plant.

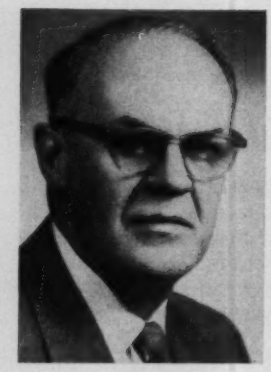
Jack L. Schumann was elected president of **Buell Engineering Co. Inc.**, New York. He succeeds **J. A. McBride** who continues with the firm as a consultant. Mr. Schumann joined Buell in 1946 as a sales engineer. Ten years later, he joined Vitro Engineering Co., and subsequently served as a vice president.

C. D. Hitchcock was named general sales manager, **Principal Mfg. Corp.**, Chicago. He had been with Minneapolis-Honeywell Regulator Co., and Flexonics Corp., division of Calumet & Hecla Inc.

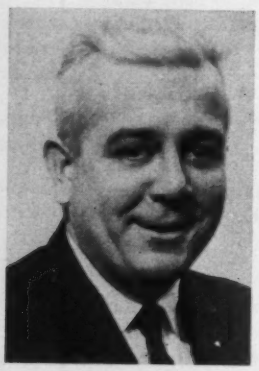
Harold L. Robinson was made sales manager of a newly created Mobile Hydraulic Div. of **Racine Hydraulics & Machinery Inc.**, Racine, Wis. He was with Vickers Inc., Detroit. **Clare Hellenberg** was made chief engineer of the division.

E. J. Holihan was made purchasing agent of **Snyder Corp.**, Detroit. He was assistant purchasing agent.

Ralph Kawecki was appointed gen-



G. E. RHODES
Taylor & Gaskin v. p.



DANIEL B. LAMB
Oakite Products div. mgr.

W. C. McDONALD
Chrysler div. chief eng.

E. J. HOLIHAN
Snyder Corp. p. a.

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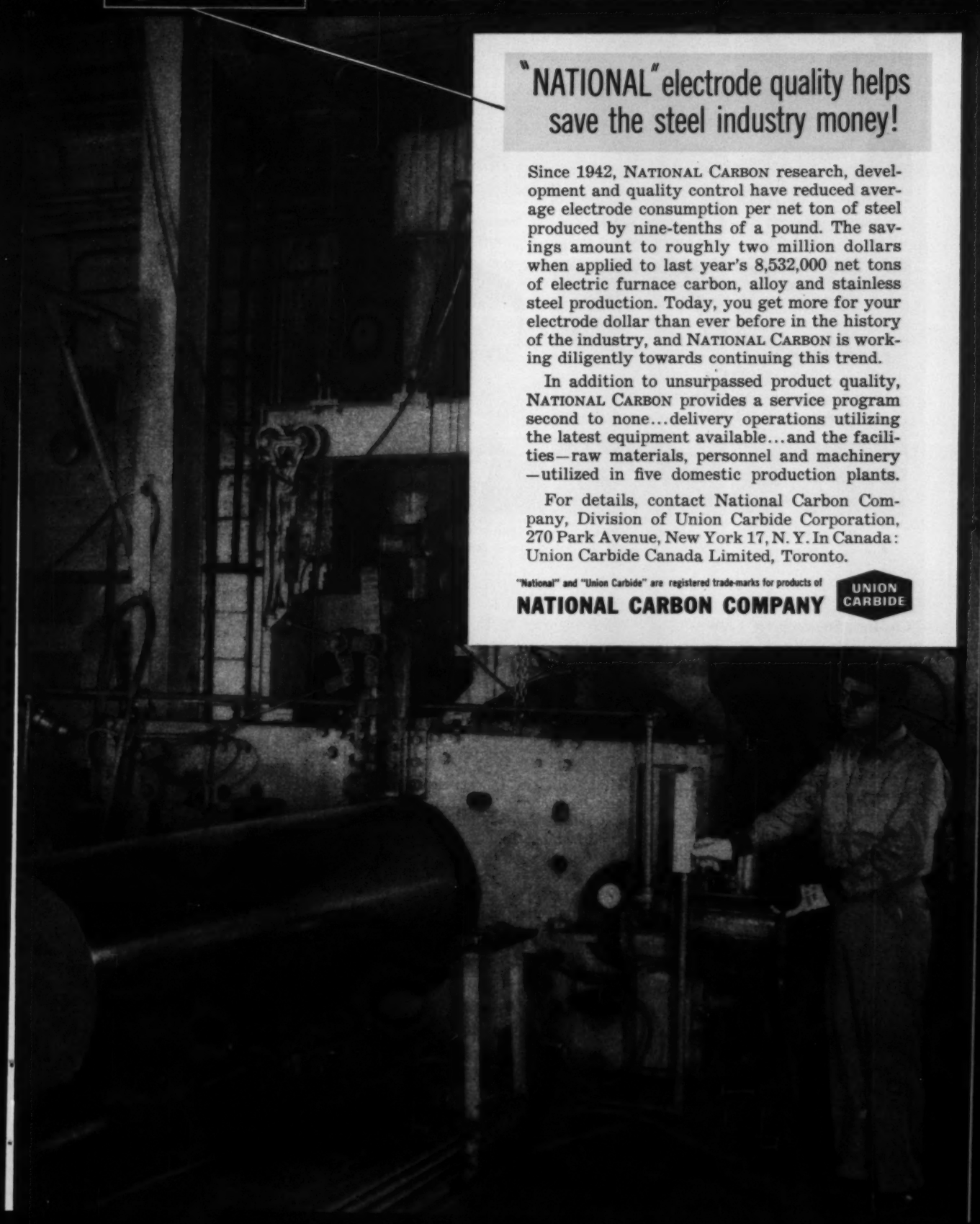

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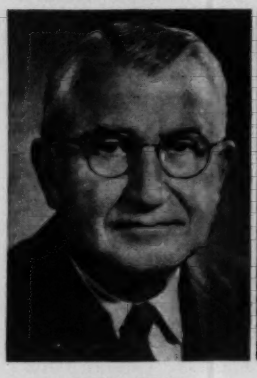
UNION CARBIDE

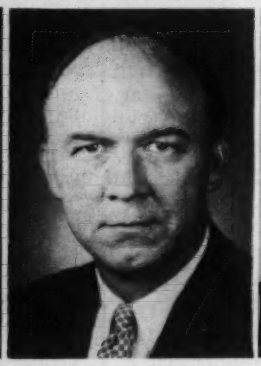
REGIS F. DUNLAVEY
Republic supt.-Buffalo

COLIN SHARP
new post at Brown & Sharpe

VICTOR J. TAYLOR
AmForge v. p.



ROY J. SUND
American Can president



HERBERT L. MISCH
Ford Metal Stamping Div. post

PHILIP O. GEIER JR.
Cincinnati Milling Machine post

eral manager, **Southington Foundry Co. Inc.**, Southington, Conn.

Roy J. Sund was elected president of **American Can Co.**, New York. A vice president of American Can, assigned executive duties in New York last January, he formerly headed the Marathon Div., Menasha, Wis. **W. C. Stolk**, former president, continues as chairman and chief executive officer. **Donald A. Snyder** was elected a vice president of American Can and general manager, Marathon Div.

F. B. Fairman was named hot strip mill superintendent, **Empire-Reeves Steel Corp.**, Mansfield, Ohio. He succeeds the late **R. R. Saunders.**

Reuben T. Gustafson was made general sales manager, **Chicago Tramrail Corp.**, Chicago.

Richard I. Allen was elected vice president, **Hills-McCanna Co.**, Chicago. He continues as general manager of the Foundry Div. and sales manager of the company.

Herbert L. Misch was appointed chief engineer of the product and production engineering office of **Ford Motor Co.'s** Metal Stamping Div., Dearborn, Mich. He replaces **H. C. Grebe**, appointed chief engineering consultant to the division, relinquishing active duties due to health.

Philip O. Geier Jr. was elected vice president and appointed assistant general manager, **Cincinnati Milling Machine Co.**, Cincinnati. He was manager of the Products Div.

Wesley H. Hauschildt was made chief production engineer for aluminum operations in the Foundry Dept., Bay City, Mich., plant, **Dow Metal Products Co.**, division of Dow Chemical Co. He was plant metallurgist, Light Metals Dept., American Brake Shoe Co.

Nathaniel Pope was made sales manager, Pacific Coast Div., **Revere Copper & Brass Inc.**, at Los Angeles. He succeeds **Jack C. Hurst**, resigned for reasons of health.

Regis F. Dunlavey was appointed superintendent, Finishing Dept., at the Buffalo steel plant of **Republic Steel Corp.** He succeeds **L. R. Silliman**, recently named assistant plant manager. **James C. Caher** was named to Mr. Dunlavey's former post of assistant superintendent, Finishing Dept.

Colin Sharp, West Coast service manager for **Brown & Sharpe Mfg. Co.**, returns to Providence, R. I., headquarters to assume the post of director of research and development laboratory, Cutting Tool Div.

Victor J. Taylor was named a vice president, **AmForge Div.**, American Brake Shoe Co., responsible for the West Coast operation. In 1952, he was assigned to start operations of AmForge's Azusa, Calif., plant. He has been district manager in charge of West Coast sales and production.

J. Chase Fielding was named a vice president of **Airaterra**, Glendale, Calif. He continues in Washington as manager of the Government Div.

Donald L. Miles was appointed vice president and sales manager, **Metasurf Corp.**, Detroit. **J. M. O'Brien**, who formerly headed sales, was elected executive vice president.

Benno Von Mayrhauser, general manager, was elected a vice president of **Baird-Atomic Inc.**, Cambridge, Mass.

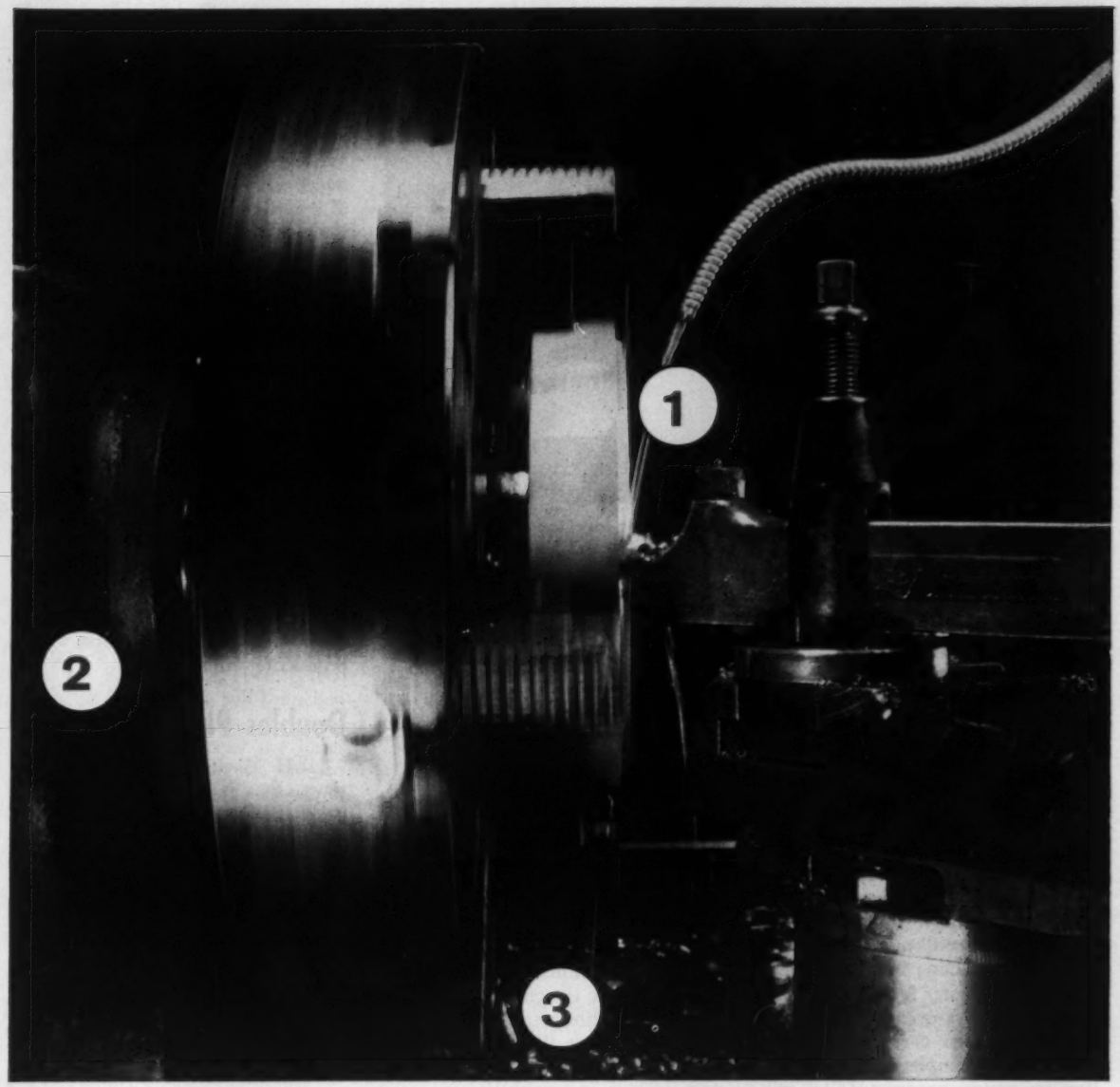
Dr. Wayne Masters was made manager of the Antenna Laboratory at **Melpar Inc.**, Falls Church, Va., subsidiary of Westinghouse Air Brake Co.

John F. Delany was named manager of can sales, **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. He was can sales Eastern representative in New York.

OBITUARIES...

Herman R. Urbach, treasurer and general manager, **O. Hommel Co.**, Carnegie, Pa., died June 9.

Mark M. Kindig, 83, president, **Burger Iron Co.**, Akron, died June 18.



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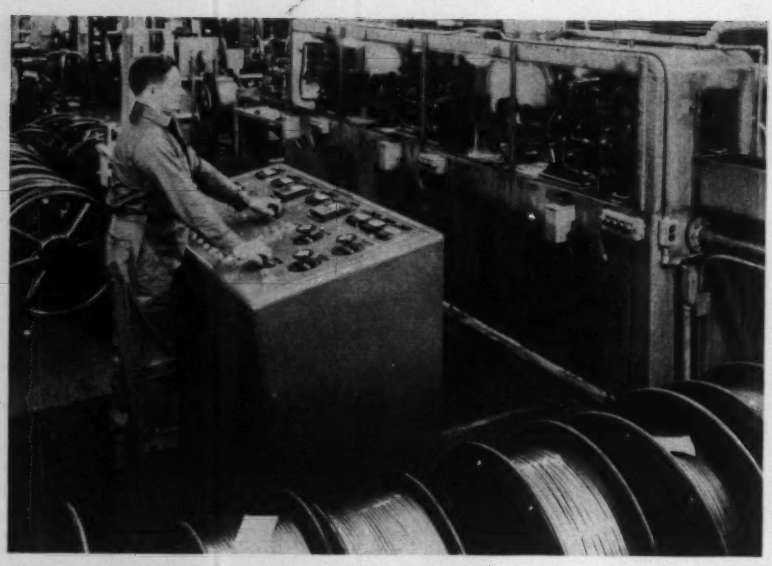


High speed wire flattening mill is part of equipment installed by . . .

Athenia to Double Output Of Strip at Clifton Mill

"WE EXPECT to recapture some of the domestic market that has been lost to foreign producers," says John A. Johnson, manager of the Athenia Steel Div., National-Standard Co., Clifton, N. J. "We are now competitive over a wider range of sizes of high carbon steel strip than before" completion of a $3 million expansion program ($2.2 million for production equipment and $800,000 for buildings and plant utilities).

Included in the production equipment are one of the world's fastest wire flattening mills, a high precision strip steel flattening mill, new slitting lines, and a large capacity annealing furnace.

• **Rolling Mill**—New equipment includes a three stand, two high mill for rolling steel strip, 0.5 in. and narrower, in standard 500 and 1000 lb coils, from round wire. This mill operates at speeds up to 3300 fpm. It was made by Waterbury Farrel Foundry & Machine Co. and replaces 15 single pass machines that produced smaller, 200 lb coils at a rate of only 225 fpm. The mill is equipped with Reliance VS drives and Pratt & Whitney automatic width and thickness gages for producing strip to extremely close tolerances and with better grain structure and surface finish. Tolerances are held within 0.002 in. in width and 0.00025 in. on thickness.

Athenia also has installed a 13 in. reversing Sendzimir mill.

• **Slitting Lines** — Two new strip steel slitting lines mark a growing trend toward high speed handling of strip steels in large coils.

One of the lines can produce up to 204 miles of finished strip in 1 hour. It can slice 5000 lb coils of 17 in. wide steel into as many as 24 strips within tolerances of 0.002 in. Top operating speed is 750 fpm.

The other line can slice 2500 lb coils of 13 in. wide steel into as many as 24 strips within tolerances of 0.001 in. Top operating speed is 500 fpm. Steel thicknesses may range from 0.001 in. to 0.065 in.

Equipment for the slitting lines (payoff gear, slitters, and rewinders) was made by H. J. Ruesch Machine Co., Newark, N. J.

• **Annealing Furnaces**—Seven Lee Wilson, bell type, annealing furnaces with a total charging capacity of 3 million lb have been installed. Four of the furnaces, installed about a month ago, will accommodate steel coils 5 ft in diameter stacked 10 ft high. They are convection type in which heated gases flow under pressure around the charged steel. The steel being annealed is protected by an internal cover that is double sealed to contain protective, inert gases. Automatic safety controls and automatic temperature monitoring equipment have been installed.

The firm's engineers have designed payoff stands for equipment in customer plants to handle the larger coils of strip. Result: Lower material handling costs and longer production runs.

Doubles Plant Size

H&H Machine Co. Inc., Norristown, Pa., is doubling the size of its manufacturing facilities. The firm specializes in the design, tooling, and fabrication of small precision tubular parts. Vacuum tube parts are also produced.

Plans Argentine Plant

Duranor, Industrial Quimicas Sociedad Anonima Industrial y Commercial will build a phenol plant at Rio Tercero, Argentina. It'll have a daily capacity of 27.5 net tons. A multimillion dollar loan granted the firm by the Export-Import Bank, Washington, will be used to buy U. S. built chemical equipment for the plant. Duranor was formed by Hooker Chemical Corp., Niagara Falls, N. Y., and Atanor, Compania Nacional para la Industria Quimica, Buenos Aires.

Onsrud Buys Press Line

Onsrud Machine Works Inc., Niles, Ill., purchased the Hydraulic Press Div. of Berthelsen Engineering Works Inc., Joliet, Ill. The product line acquired includes heated platen, single and multi-opening laminating presses.

Opens Spring Facility

A $500,000 production center for cold wound springs has been opened by Alco Products Inc., Schenectady, N. Y. The facility is housed in an 18,000 sq ft addition to the firm's plant in Chicago Heights, Ill. It consolidates the production of industrial and railroad springs in one location. Cold wound springs formerly were made at Latrobe Pa.

Buys Refining Plant

Minerals Engineering Co., Grand Junction, Colo., purchased a refining plant near Salt Lake City, Utah, from Howe Sound Co., New York. The new owner will use the $1.4 million facility to produce vanadium pentoxide.

Pollock Gets Contract

William B. Pollock Co., Youngstown, has been awarded a contract by Koppers Co. Inc., Pittsburgh, to furnish five self-propelled steel ladle and slag transfer cars. The equipment is part of the Jones & Laughlin Steel Corp.'s oxygen steel plant expansion at Cleveland. The ladle transfer cars are designed to handle 200 ton heats from the new oxygen vessels.

Improves Sinter Output

Jones & Laughlin Steel Corp., Pittsburgh, is constructing new breaking, screening, and cooling facilities for the sinter plant at its New York Ore Div., Star Lake, N. Y. Daily capacity: 3800 gross tons of product. The new facilities, including a vertical shaft stationary cooler, are being installed by Dravo Corp., Pittsburgh.

Gets Midwest Contracts

Contracts involving more than $5 million have been awarded to the David W. Murray Co., Cleveland, for facilities to be installed at the plant of Midwest Steel Corp. at Portage, Ind. The project involves mechanical erection, piping, and electrical installation of an electrolytic tinning line and a galvanizing and annealing line. Midwest is a division of National Steel Corp., Pittsburgh.

ASSOCIATIONS

Ductile Iron Society, Cleveland, elected these new directors: Sam F. Carter, American Cast Iron Pipe Co., Birmingham; H. J. South, American Brake Shoe Co., Medina, N. Y.; B. L. Baptist, Beloit Iron Works, Beloit, Wis.; E. P. Trout, Lufkin Foundry & Machine Co., Lufkin, Tex.; and G. W. Phelps, Otaco Ltd., Orillia, Ont.

Fluid Controls Institute Inc., Pompano Beach, Fla., elected these officers: President, F. E. Weldon, General Controls, Skokie, Ill.; first vice president, R. F. McCormick, Automatic Switch Co., Florham Park, N. J.; second vice president, E. A. Bianchi, Mason-Neilan Div., Worthington Corp., Norwood, Mass.; treasurer, P. K. Rogers Jr., Skinner Electric Valve Div., Skinner Chuck Co., New Britain, Conn.; and corporate secretary, S. J. Reid, Barnes & Jones Inc., Newtonville, Mass. E. R. Rath is executive secretary.

CONSOLIDATIONS

Barry Controls Inc., Watertown, Mass., and **Wright Line Inc.**, Worcester, Mass., will merge, subject to approval of stockholders. The consolidated company will be named Barry-Wright Corp. Officers will include: Chairman, R. P. Collins; president and chief executive officer, Ervin Pietz. Wright makes accessory and punched card handling equipment for data processing and computer systems; Barry, shock and vibration isolators and suspension systems for aircraft, missiles, electronic equipment, and industrial machinery.

Northrop Corp., Beverly Hills, Calif., purchased **Acme Metal Molding Co.**, Los Angeles, manufacturer of architectural aluminum products.

Aeronca Mfg. Corp., Middletown, Ohio, purchased **United Welding Co.**, that city, a former division of Baldwin-Lima-Hamilton Corp. The transaction included United Welding's name, good will, and inventory, as well as a lease with option to buy on land, buildings, and equipment valued at $550,000. In March, Aeronca merged with Buensod-Stacey Inc., New York.

High Voltage Engineering Corp., Burlington, Mass., manufacturer of radiation producing particle accelerators, acquired **Applied Radiation Corp.**, Walnut Creek, Calif., producer of microwave linear accelerators.

NEW OFFICES

Leschen Wire Rope Div., H. K. Porter Company Inc., St. Louis, opened a district office and warehouse at 216 S. Klein St., Oklahoma City, Okla. Stocks of wire rope will be maintained. Hugh Bergin is district sales manager.

NEW PLANTS

Gear Div., Indiana Gear Works Inc., moved all facilities to its new plant at 3051 N. Post Rd., Indianapolis 19, Ind.

James F. Burns Co. is moving at the end of June into its new plant at 1601 Industrial Highway, Pennsauken, N. J. The firm's manufacturing capacity will be increased by at least 300 per cent. Burns makes cast iron boxes; steel boxes and cabinets; and ice can fillers, trucks, and dogs.

NEW ADDRESSES

Traylor Engineering & Mfg. Div., Fuller Co., Allentown, Pa., moved its branch office to 380 Madison Ave., New York, N. Y. The office remains under the management of Matthew Langan. Traylor makes machinery for the mining and processing industries.

Swartwout Div., Crane Co., manufacturer of electronic process control instrumentation, moved its production facilities and headquarters from Cleveland to Hooksett, N. H. The division maintains a Cleveland sales office at 21877 Euclid Ave.

your product's reputation and sales... can go down hill fast

... *if nuts keep coming loose*

Suppose you were your own customer, and bought the product *you* make. You'd expect it to stand up to the job, whether it was a racing cart, a heavy-duty crawler, or a crusher. You'd want it to endure the bumps and thumps and constant vibration of rugged use without coming unstuck at the bolts. If a nut came loose and made you lose time or production, you'd certainly think twice about buying that product again.

This is precisely why so many of America's leading manufacturers have guaranteed the reliability of critical bolted connections on their products with Elastic Stop® nuts.

They know that a product's reputation for dependability is built in the field and they know that reorders are written in customers' maintenance records. They've verified through field experience that in the long run Elastic Stop nuts pay their own way because the exclusive nylon locking inserts keep them from working loose . . . even under the most punishing conditions of shock, impact or vibration! Elastic Stop nuts are the equivalent of "free" insurance against fastener failure for *their* product!

Whether your product sells for three dollars or for thousands, we think you'll be interested in a copy of the hex nut catalog No. 706. It details the regular, thin, heavy and light hex types in USS and SAE thread series and various materials and finishes; plus many dimensional "specials".

ESNA's complete line may change many of *your* "special" requirements into standard parts. Write Dept. S52-677, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.

for the ring **O** *of reliability*

ELASTIC STOP NUT CORPORATION OF AMERICA

FENDS FATIGUE—Metals coated with certain polar organics like octyl alcohol, for example, show a 600 per cent increase in fatigue resistance, says the National Bureau of Standards, Washington. Investigators speculate that the polar group forms a single-molecule layer over the metal which bars water and oxygen attack.

CROSSING THE BAR—Buildup of an oxide layer involves migration of metal ions from the metal phase through the film of oxide to meet oxygen on the outer surface. In alloys, the relative rates of diffusion of the different ions may cause the proportions of metals in the scale to vary from the alloy composition. British researchers also believe that with some nonferrous alloys there is a characteristic temperature above which thickening of the oxide film proceeds relatively rapidly.

ADVANCE SOLID PROPELLENTS—Thiokol Chemical Corp.'s latest formula for a solid rocket propellent permits successful firing at minus 85 up to 300° F. It opens the way for its application to advanced propulsion systems, the Bristol, Pa., firm believes. Current use: Falcon rocket engines.

REPORTS COBALT PROGRESS—The latest dope on technical advances in cobalt is being handled by the Cobalt Information Center, Battelle Memorial Institute, Columbus, Ohio. Samples: Nonmetallic dispersions in sintered chromium-cobalt alloys improve high room temperature strengths up to 143,000 psi; welding techniques successful with austenitic stainless steels also work on cobalt alloys.

REPORT COLUMBIUM IMPROVEMENTS—People attending a symposium early this month learned of these discoveries in columbium metallurgy: Alloys containing tungsten and titanium have good mechanical properties and oxidation resistance to 2550° F; those which contain aluminum and vanadium are a hundred times better than pure columbium in resisting oxidation, have better mechanical properties, yet retain a low neutron cross section, report metallurgists from Union Carbide Metals Co., a division of Union Carbide Corp., New York.

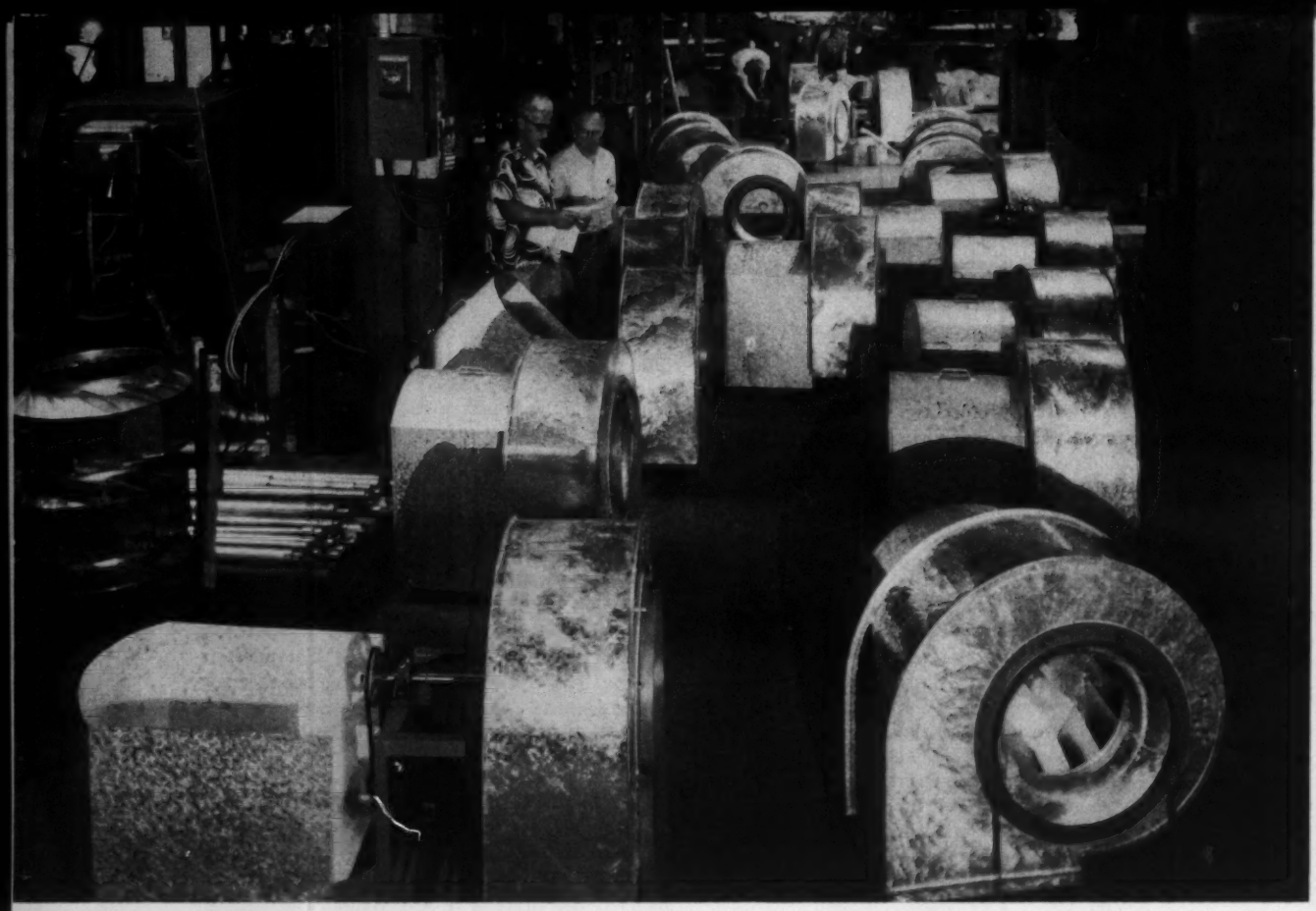
HOTTER HARDNESS TESTER—Latest microhardness test device for study of strength-temperature behavior has a motor drive, vacuum locks, and automated indenter. The machine, developed by J. H. Westbrook, Metallurgy & Ceramics Research Dept., General Electric Co., Schenectady, N. Y., features a fine screw adjustment, choice of six loads, and fast removal of specimens.

PUSH BRASS-BRONZE USE—Confirmed data on 16 mechanical and physical properties of three standard copper-base alloys have been published by Battelle Memorial Institute, Columbus. The sponsor, the Brass & Bronze Ingot Institute, Chicago, says the information suggests many applications not usually considered by designers.

HOLDS OFF CORROSION—A group of aluminum-iron-nickel alloys withstands deterioration of 700° F high purity water, claims Aluminum Co. of America, Pittsburgh. Application: Advanced atomic reactors which will operate at temperatures some 40 per cent higher than present cladding alloys.

TAILORED DUCTILITY—Aluminum with additions of boron or rare earths can be had in ductile form, says Sintercast Div., Chromalloy Corp., Yonkers, N. Y. Former compositions of that type were almost too brittle to work; the new material is said to be almost as ductile as pure aluminum.

NEW SPRING WIRE—A new precipitation hardening austenitic alloy called NS-A286 shows superior properties as spring wire for 600 to 1000° F service, says National-Standard Co., Niles, Mich. It costs perhaps a tenth as much as exotic alloys and at 1000° F has half the relaxation losses of comparable alloys operating at 850° F, the firm claims.



How to Tell Good Hot Dip Galvanizing

Photomicrographs can reveal much about quality. Visual inspection will also show many coating defects and indicate whether good practice has been followed. Here's what you should look for

THE METALWORKING industry uses large quantities of galvanized iron. But, as a user, do you know how to specify? More importantly, do you know how to judge quality?

To aid the user and purchaser, the Midwest Job Galvanizers Association Inc., Chicago, has published a guidebook on the quality control of hot dip galvanizing. It discusses the process, shows examples of good and bad galvanizing practice, indicates the causes of faulty work, and outlines the specifications used in purchasing.

• Hot dip galvanizing is both a science and an art.

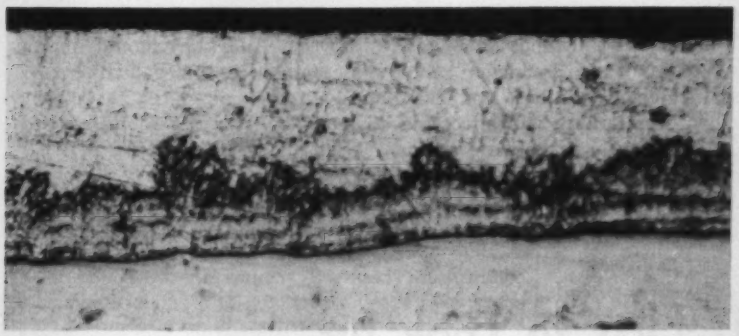
Volumes have been written about the process and its variables. But galvanizing of finished parts is still essentially a hand operation, depending on the skill of workers, as well as on the quality and purity of the materials used.

• Good hot dip galvanizing requires a good grade of zinc.

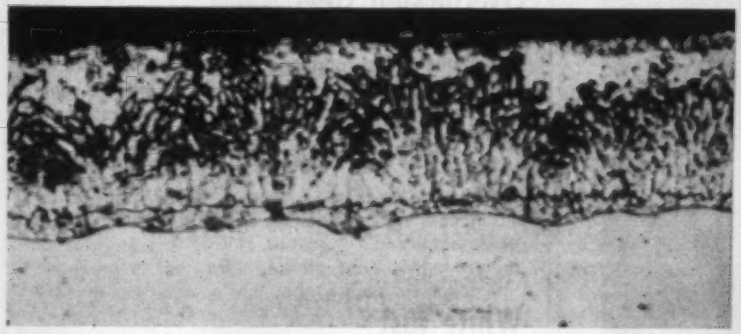
Specifications of the American Society for Testing Materials require that all zinc used for galvanizing shall be at least equal in quality to the grade designated as "Prime Western." It may not be made from remelted zinc scrap or by "sweating" zinc dross, regardless of the analysis.

The appearance of the fracture on a broken slab of zinc used for galvanizing is an indication of quality. It should be bright and of fine grain. Remelt zinc will usually be coarse grained, dull, and have scattered bright areas.

The association suggests standard sampling procedures for checking kettle analysis and lists typical results. Some specifications do not allow the use of aluminum as a brightener metal; the amount need-



Photomicrographs showing cross section are the best way to judge the nature of a galvanized coating. They show the relation of the pure zinc layer (top) to the iron-zinc alloy. The thicker the pure zinc layer, the longer the period of service before brown discoloration occurs. The coating shown above could stand up ten times longer than the poor one below



ed is so low that some laboratories have difficulty in separating this element spectrographically to the desired accuracy. If the lab does not have suitable standards set up, chemical methods are recommended. (Aluminum content will usually be below 0.01 per cent.)

• There are specifications on coating thickness, finish, and adherence.

Differences may arise between supplier and purchaser unless standard methods of checking thickness are agreed upon. A simple and common method is the use of a magnetic thickness gage. Each type gage has limitations which are spelled out by the manufacturer. Accuracy can be improved by taking a number of readings, to average out minor variations, but in all cases, they should be taken on suitable areas of the parts. The basic approved coating of 1 ounce per square foot has been set as equal to 0.0017 in. in thickness.

While the magnetic gages are easiest to use, they may have edge or wall effects, be affected by too small diameter in rounds, or too thin a basis metal in flats. Chemical stripping tests, or microscopic examination of sectioned parts, are the basic standards although they require far more time and effort.

• Service life of galvanized parts depends on the thickness of the zinc coating and its quality.

When galvanized parts are exposed to the atmosphere, they begin to lose their brightness. The degree of darkness depends on the nature of the exposure. It is not until all of the zinc of kettle purity has been consumed that the formation of a yellow-brown rust or corrosion product appears. At this point, there is still protection by the galvanized layer, but the iron-zinc alloy below the outer layer is being affected. Further exposure will generally result in darker surfaces; yet there is still active protection from the galvanized layer.

At the point where the surface zinc is consumed, and while the underlying layers are still contributing their share of corrosion resistance, it is advisable to paint the structure for maximum service life.

• Some of the defects causing poor service life can only be determined by microscopic examination. But so far there are no standards for such inspection.

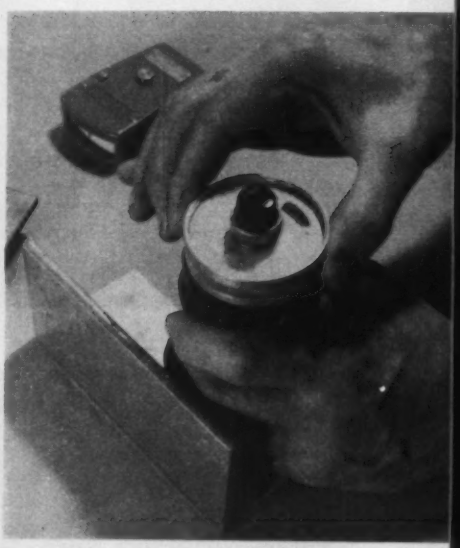
Poor quality control during galvanizing may lead to defective coatings. Several factors are involved, including:

- Overpickling (burning or overetching), improper pickling.
- Little or no rinsing after pickling.
- Dirty tanks—saturated with iron.
- Contamination of the pre-dip flux material.
- Use of below-grade zinc.
- Kettles saturated with dross.

Use of microscopic examination with photomicrographs for reference and comparison, will indicate those poor practices. Many purchasers are requiring such tests, although in many cases the coatings with such defects lack lustre and have a rough feel.

• Some variations in surface appearance are not defects.

One of the best examples is the



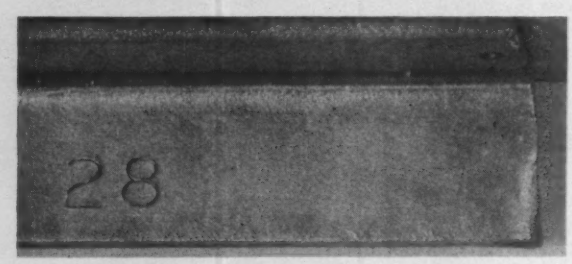
Thickness gage measures galvanized layer. Corrections may be required for some shapes, locations

large "spangle" which appears in the area where tongs have been used to grip the article as it is removed from the kettle. The marking does not damage the coating and is typical of parts which must be handled manually.

The association also offers help in fabricating methods for galvanized products. Production processes, storage conditions, and even methods of marking will affect the galvanized part. If users are aware of those factors, the level of quality which they obtain will be improved. And sales should improve for both users and galvanizers.

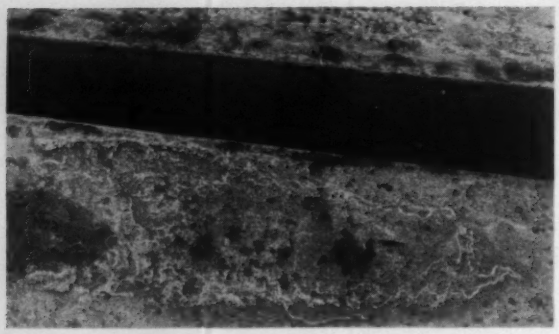
• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Eight Galvanizing Defects to Look for



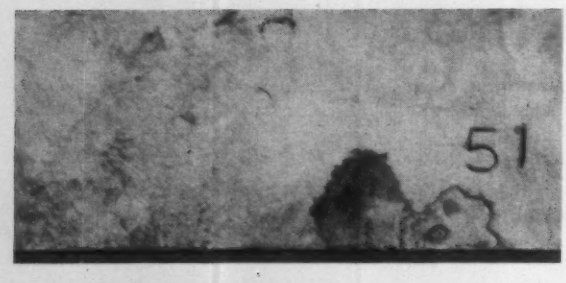
Overpickled steel

Excessive pickling causes etch pits on the surface of the steel. The roughened surface will be covered by the zinc, but deep pits can't be filled; some smoothing will take place, but the rough surface persists



White rust

A powdery white compound, which can be zinc oxide, carbonate, or both can form as a result of moisture and elevated temperatures. It can also occur in sheets warehoused under high heat and humidity conditions. If sheets are in contact and moisture is present, white rust can form in a matter of hours at 150° F. Surface coatings—organic films, chromate conversion layers—will retard formation



Water staining

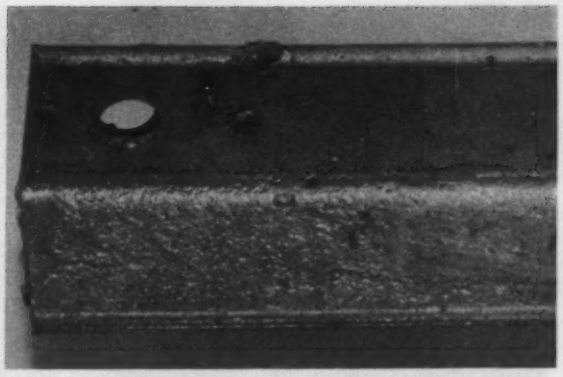
Water containing solids on heated galvanized work will evaporate, leaving a residue. The color of the deposit is likely to be dark, distinguishing it from white rust produced from reaction with the zinc coating

Flux spots

This is the most common defect on galvanized products. The spots are due to pickup of the kettle flux, which becomes thick and viscous as it loses its ammonia content. If flux spots are removed from the surface of the galvanized article, no harm is done to the coating. If they are permitted to remain, they encourage corrosion

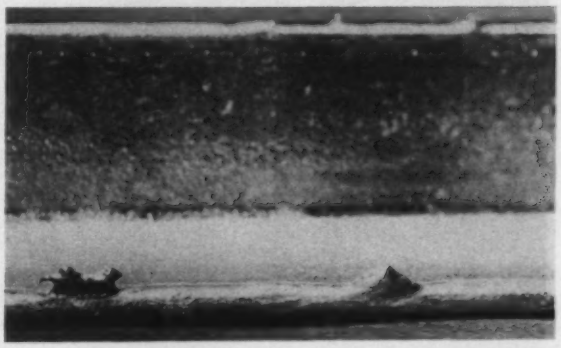
Oxide, scruff and dross

Dross is formed by reaction between the zinc and iron. It is heavier than the zinc, tends to settle to the bottom of the kettle. The sandy appearance on inside of the angle is due to dross. Other deposits are oxide and scruff from surface and edges of the kettle. Both result from poor kettle practice; parts should be redipped



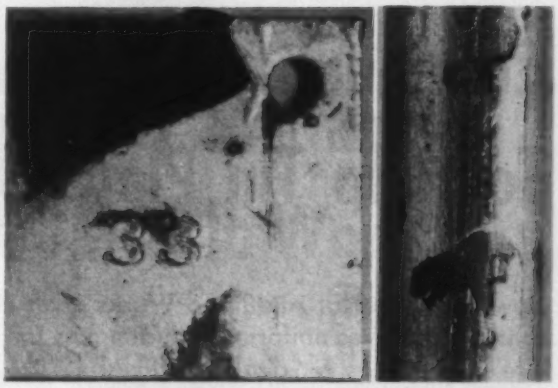
Lumps and projections

Particularly likely on heavy sections, "spikes" and "icicles" result from the tendency of the molten zinc to flow as the part is cooling. Careful handling, changing of the position of the part during cooling, shaking or bumping will reduce their formation



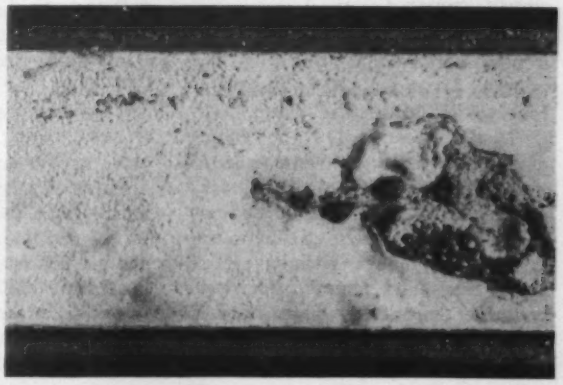
Uncoated areas

"Skips" and "stickers" are caused by poor preparation of the work prior to galvanizing. Contamination of the surface can be caused during the pickling, or afterwards, by some form of contamination of the surface of the steel. Usually, the areas can be cleaned and the work dipped again. If they occur frequently, preparation processes should be studied to eliminate the problem



Acid spots

When the flux becomes "dead" or inactive, it can be entrapped in the zinc coating. Exposed to the atmosphere, it absorbs moisture, forms dilute hydrochloric acid which moves down vertical surfaces, producing "weep lines." Tiny black specks on the coating surface, in an area with a sandy appearance, indicate potential trouble, short coating life



Looping towers at the entry end of the line hold 1250 ft of strip

Continuous Annealing Line To Help Tin Plate Users

New equipment at Aliquippa Works gives close temperature control, improves uniformity, and makes for finer grain structure, says Jones & Laughlin official

STEEL STRIP for tin plate is processed at speeds up to 2000 fpm in a new, continuous, annealing line at the Aliquippa, Pa., Works of Jones & Laughlin Steel Corp.

"Modern features of the equipment are especially advantageous to the can industry," says John E. Timberlake, J&L vice president-sales. "It provides greater uniformity of product, permits use of fewer types and tempers, improves container strength where needed, and simplifies inventory problems for tin plate customers."

• Relatively short dwell time in the heating and soaking zones produces a fine grain structure in the steel.

A single strand of strip passes through the line under closely controlled heating conditions. Hardness variations are minimized.

Material passes through the line in less than 2 minutes. When strip travels through the fuel fired annealing furnace at 1000 fpm, it is heated to 1350° F for 22 seconds, soaked 29 seconds at 1350° F, cooled 22 seconds to 900° F, and then cooled to 150° F in 43 seconds.

The line handles coils weighing up to 50,000 lb and measuring 85 in. OD, in 18 to 38½ in. widths.

The looping tower stores about 1250 ft of strip, preventing delays during welding. An air cylinder, strip brake mechanism bears down on the rolls and prevents unthreading of the line in case the strip breaks.

• An electronic computer will record temperature and speed variables. Co-ordination of electrical and mechanical drives provides smooth operation.

Initially, the computer will record strip gage, temperature, speed, and other data. Later, it will regulate temperature and speed variables.

Co-ordinated mechanical and electrical drives minimize tension variations during acceleration and deceleration.

A thickness gage at the entry end of the line indicates irregularities in strip thickness. That permits offgage material to be cropped from the head and tail ends of the coil before annealing.

Palladium Alloy Eases Hydrogen Purification

AN IMPROVED diffusion cell for the preparation of ultrapure hydrogen uses a new palladium alloy, reports J. Bishop & Co. Platinum Works, Malvern, Pa. The alloy has unlimited stability when heated and cooled in hydrogen, thus outlasting pure palladium, the company says.

• **Traffic Cop**—Palladium is used for hydrogen purification, permitting the separating of the pure gas from mixtures. At elevated temperatures, the hydrogen diffuses through the metal; other gases do not. So the gas collected on the other side of the palladium sheet is high purity hydrogen. It has a number of metalworking applications, including furnace atmospheres.

The new alloy is said to be more than two times as permeable to hydrogen as pure palladium and lower in cost.

• **Heat Is Problem** — When pure palladium is heated and cooled in hydrogen, dimensional changes occur. While the mechanism of the change is not entirely clear, the results are definite—the element warps and buckles.

• **Intermittent Use**—The new alloy permits easier startup and shutdown of hydrogen purification equipment, since it is not necessary to remove the hydrogen first. The alloy's stability under these conditions means that the user will not need to be concerned about warping.

Cells for hydrogen purification using the new alloy are furnished by Bishop in laboratory, pilot plant, and commercial sizes.

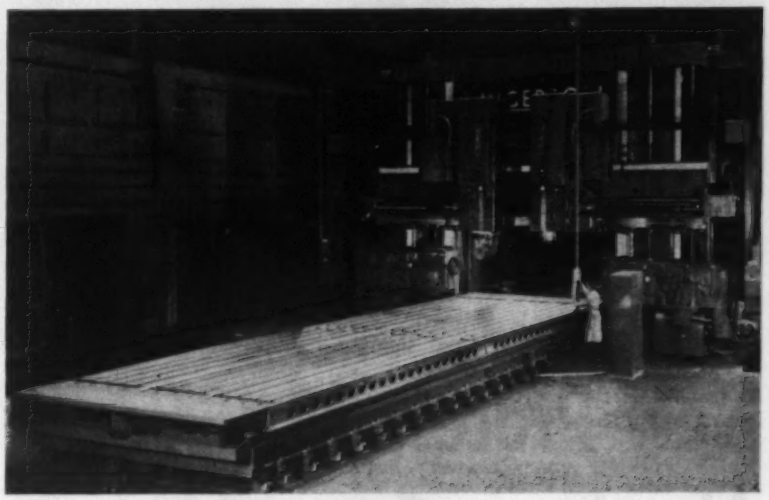
Space Age Cleaning Services Offered

Specialized cleaning facilities, designed primarily for missile work, are available to industry on a contract basis. The service is offered by Dow Industrial Service, Cleveland, a division of Dow Chemical Co., Midland, Mich.

The facilities, located at Air Force bases and missile centers, were built to handle airborne components and ground support equipment.

• **White Rooms** — The equipment used is similar to that in many laboratories, but it is built to industrial scale. Workers enter the "white rooms" through an air lock, wear lintfree coveralls or smocks, head covers, foot covers, and disposable polyethylene gloves. Parts being cleaned are not touched with bare hands.

The rooms are under positive air pressure to prevent the infiltration of external dirt. Room air is cleaned by electrostatic precipitators to eliminate dust and lint. Electrically powered hoists handle heavy or bulky parts.



Dwarfed by the machine he's checking, the operator puts four milling heads through their paces

Powerful New Machine Takes 700,000 lb Workpiece

THE four milling heads on the machine above have 700 hp available for cutting. It is being checked out in the plant of Ingersoll Milling Machine Co., Rockford, Ill.

Built by Ingersoll for its own use, it is one of a series of 35 large mills —they're 10 to 18 ft wide. The machine it replaces is just over five years old.

All functions of the machine are under power. The most frequently used operations are called for from the pendant station. From it, for example, the operator directs the speeds of all the spindle drive motors.

With the pushbuttons, the operator can change the spindle speed while the cutters are engaged in the work. The drive motors are equipped with Westinghouse Guardistor protective systems—heat sensing elements in the windings that indicate when the motor is approaching or exceeding operating temperatures.

A table feedbox provides rates of ¾ to 115 in. a minute and traverse rates of 36 ft a minute to move the table quickly for setup or for approaching the cutting area. Another development: A system that levels the rail to accuracies of 0.001 in.

The machine will handle workpieces 14 ft wide, 12 ft high, and 60 ft long.

It can handle workpieces weighing as much as 700,000 lb.

Fabrication starts with preformed cup made from coil stock (left). Other steps include drawing, ironing, trimming, flanging, printing

New Process May Boost Aluminum Canmaking

Seamless method combines drawing and ironing operations. Present market for aluminum can is 2.5 per cent of total, but some think figure will eventually rise to 20 per cent

A TECHNICAL advance may help aluminum canmakers get a larger share of the packaging market.

The development: A drawing and ironing process which turns out a seamless container with a mirror finish. The can is lighter than those with seams, and only one end requires an attached lid (closure).

Kaiser Aluminum & Chemical Corp., Oakland, Calif., says its development took five years. Breweries and fruit juice canners are said to be interested.

• Costs are claimed to be comparable to those of tin plate if shipping costs are considered. Other aluminum oriented firms continue to push their versions.

More than a year ago, American Can Co. officials believed aluminum would capture a large share of the metal container market (see STEEL, May 11, 1959, p. 104). But adoption has been slower than expected.

Reynolds and Alcoa are also active in canmaking. Reynolds is working with a seamed can with an eye on the fruit juice market. Adolph Coors Co., Golden, Colo., has stepped up production of its impact extruded can to 120 a minute (see STEEL, Jan. 12, 1959, p. 70 and Dec. 14, 1959, p. 63). Continental Can Co., New York, for some time has employed aluminum ends on certain types of tin cans.

• Kaiser starts a 30 in. wide coil of sheet through a press which preshapes small cups.

The cups are automatically fed to an ironing and drawing press. As they pass through, dies lengthen the sidewalls by pushing them farther on a punch. Ironing and drawing are done with a single stroke of the press. Formed cans are dropped onto a conveyor for washing, trimming, flanging, and printing operations.

A normal drawing operation is limited to something less than half the diameter of the product without intermediate annealing. The addition of ironing to drawing overcomes that limitation: Finished cans are $2\frac{1}{8}$ in. by $4\frac{1}{2}$ in. The body wall is 0.008 in. fully hard (Coors's product has an 0.025 in. bottom and a 0.010 in. wall).

The top and bottom of the cans are shaped to permit closer nesting in shipping cartons.

Following trimming and flanging, the cans may be lacquered internally and furnished with a label in a standard offset printing press for cans.

Summing up, D. A. Rhoades, president, Kaiser Aluminum & Chemical Corp., says: "This can is an important step in our bid for more packaging business."

Aluminium Ltd. Sales Inc., New York, reports the current sales are about $2 billion a year.

from the Power Unlimited complete belt line

90% Saving in Replacement Inventory

Ranchers Cotton Oil Company of Fresno finds length-stability of "U.S." Royal V-Belts also saves costly downtime.

Mr. E. D. Hudson, General Superintendent of Ranchers Cotton Oil, had a problem. Almost 1000 V-belts were in constant operation and, when a belt required replacement, as many as 15 had to be tested to find a compatible set of four. This caused partial shutdown and required large inventories.

Mr. Hudson, who believes in keeping abreast of new developments, had read about "U. S." V-Belts and their LENGTH-STABILITY! He decided to give them a try. Sure enough, every belt of a given size matched perfectly! Mr. Hudson now carries but 50 belts in stock and he knows that should he run short of any given size he can call his "U. S." Distributor and have the needed belts within minutes.

"We placed the entire problem in the capable lap of the George M. Philpott Co., our 'U.S.' Distributor. We merely specified machinery, h. p. and speeds. The distributors, in cooperation with 'U. S.' engineers, designed the actual drives according to their experienced judgment."

Savings in time and inventory were important. In addition, the system worked so well that in 6 months, operating 24 hours a day, there has not been a single failure in any of the hundreds of "U. S." V-Belts involved.

• • •

To Mr. Hudson and George M. Philpott Company go the honors for a wise choice that has meant untold savings. You can enjoy such savings by calling your "U. S." Distributor. He has the belts and the knowledge to save you thousands of dollars.

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Mechanical Goods Division

United States Rubber

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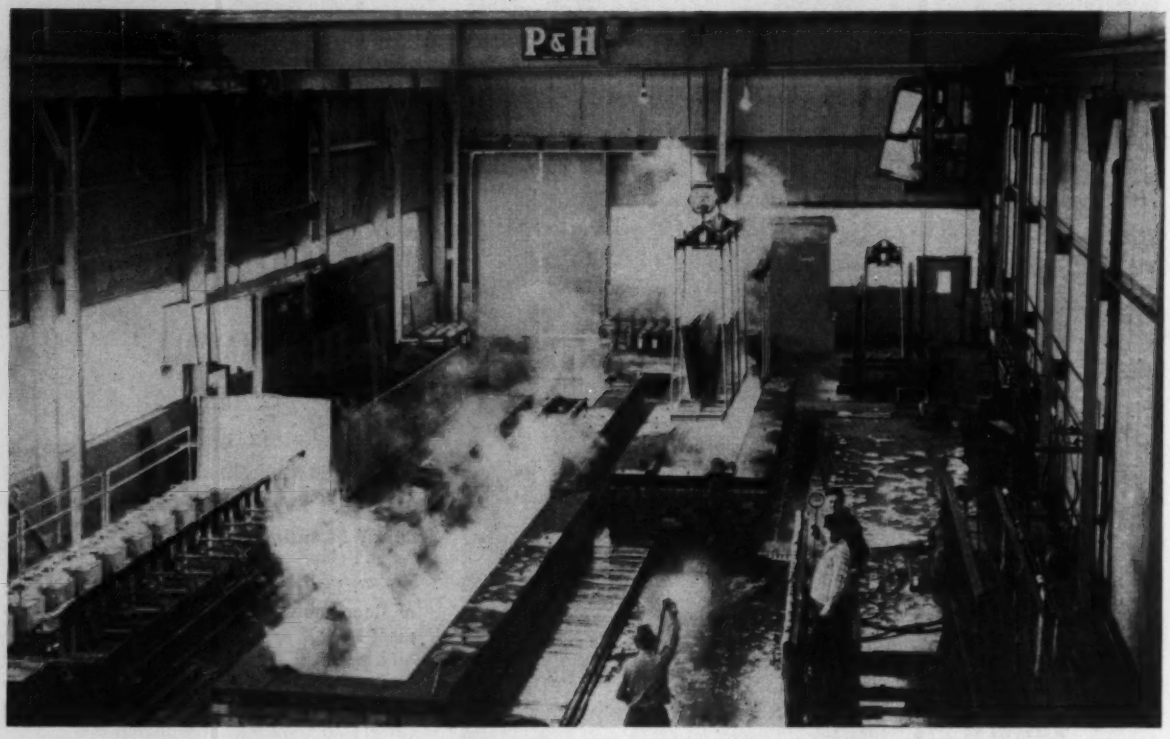


Workman waits to water spray a batch of stainless steel plates as they come from the nitric-hydrofluoric acid bath in Jessop's new pickling department

Modern Methods, Machines Update Small Steel Plant

Simplification of product flow and installation of more flexible equipment boost production in Jessop's sheet mill. New furnaces will increase melting capacity

SMALL STEELMAKERS engaged in turning out specialties must keep their equipment up to date and put a premium on efficient operation to hold costs in line and price their products competitively, says Frank B. Rackley, president, Jessop Steel Co., Washington, Pa.

Jessop is completing a $1 million modernization program in its flat rolled products department and will spend another $1 million in 1960-61 to bring its melting facilities up to date.

• The company installed new equipment and improved traffic flow in its sheet mill; addition of floor space made the shipping area more efficient.

In the new setup, flat products pass through the annealing furnace and quench; then they are flattened, sheared to dimension, pickled, inspected, and sent to the shipping department, in logical sequence. The addition of 23,000 sq ft of floor space helped cut down congestion in the area.

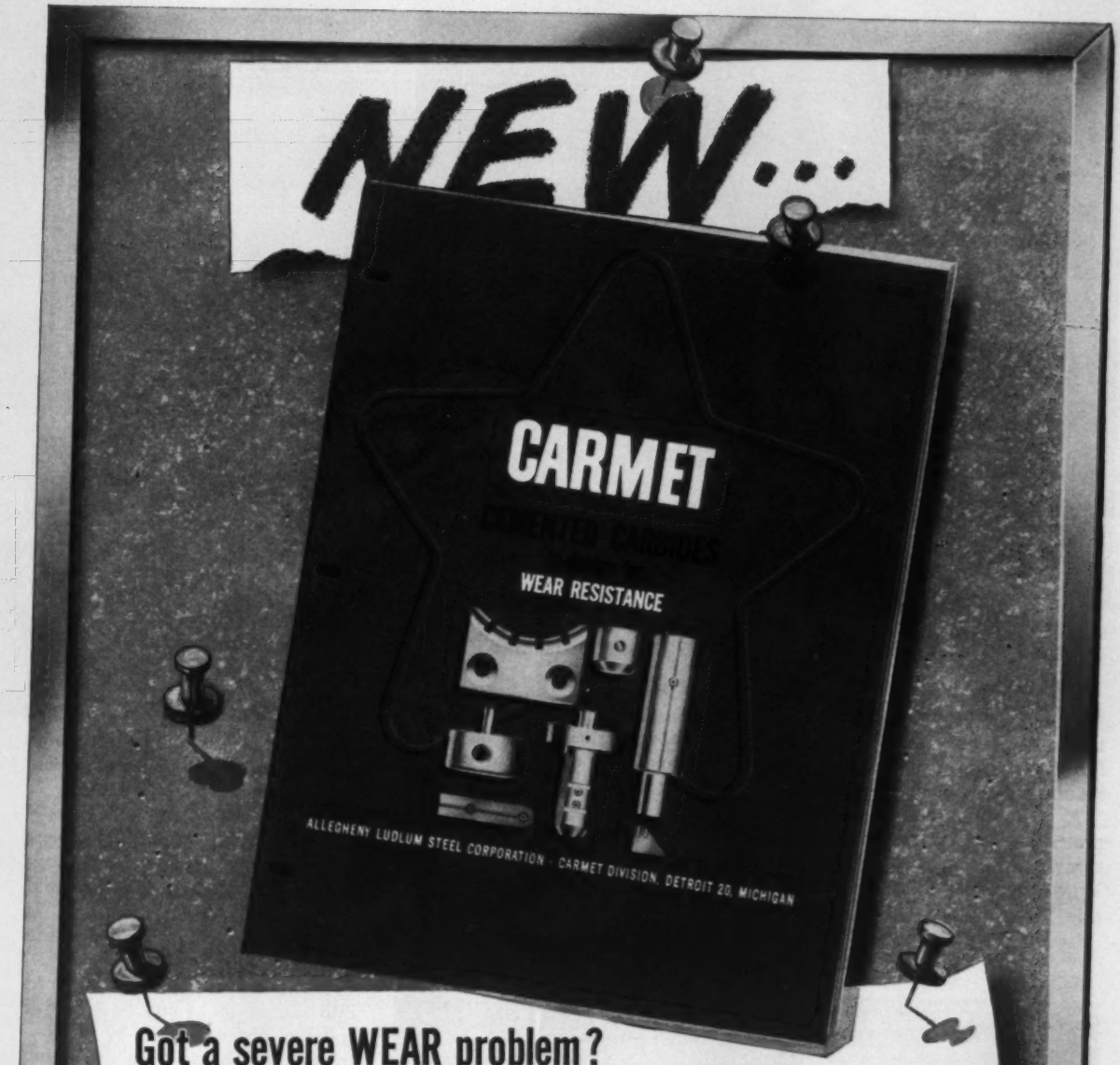
Previously, sheets and plates were stacked until they could be scheduled at machines and furnaces too old or too small to keep up with hot mill output. Priority pieces often had to be taken from the bottom of the pile. Large sheets and plates often had to be rough cropped to fit into the annealing furnace. And crisscross traffic contributed to lowered efficiency.

• Sheets and plates are annealed in a new furnace designed by company personnel.

The gas fired furnace, which measures 16 by 26 ft (inside), is half again as large as a similar unit it replaced. The older furnace is kept as a standby.

The new unit is designed to produce a fluffy scale that will break off easily during pickling and leave a bright, clean surface, says Harry K. Taylor, vice president-operations.

At the discharge end of the furnace, a water spray quench booth with four, 35,000 cfm fans that turn the spray into a mist, cools



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In Carmet's new booklet, the designer will find the charts, graphs, case histories, and tables of information needed for intelligent selection and application of the Carmet Cemented Carbides. And, there's a special section on design criteria for top performance. Ask your local Allegheny Ludlum representative for a copy, or write: *Allegheny Ludlum, Carmet Division, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. S6-4.*

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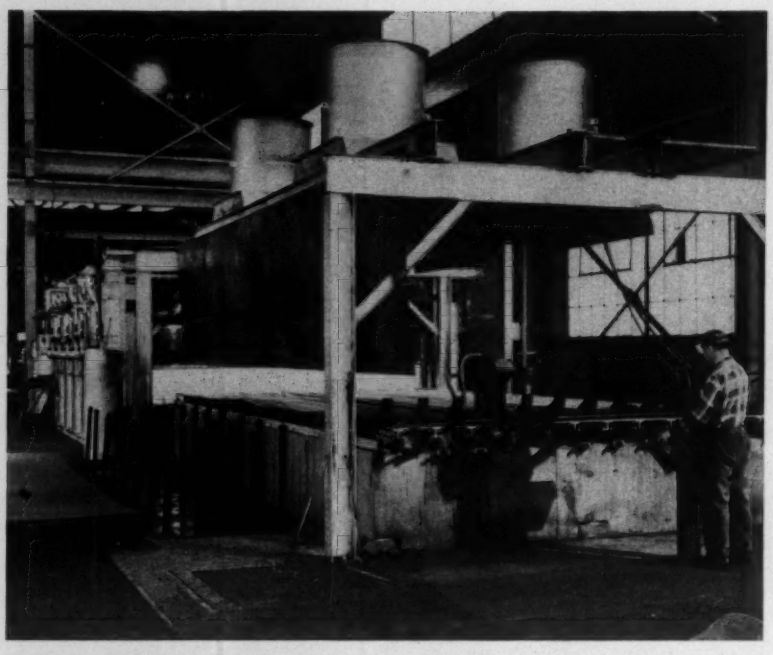


Stainless steel sheets are taken out of the new, gas fired annealing furnace; a water spray, turned into a mist by four powerful fans, cools the sheets

sheets and plates quickly and uniformly—an important part of austenitic stainless steel processing.

A wall at the end of the booth protects the operator from scale and spray. Two fans will be added to blow scale into a collection area beside the building.

• The new shear cuts all gages; vacuum lifting equipment prevents scarring of the material when it is handled.

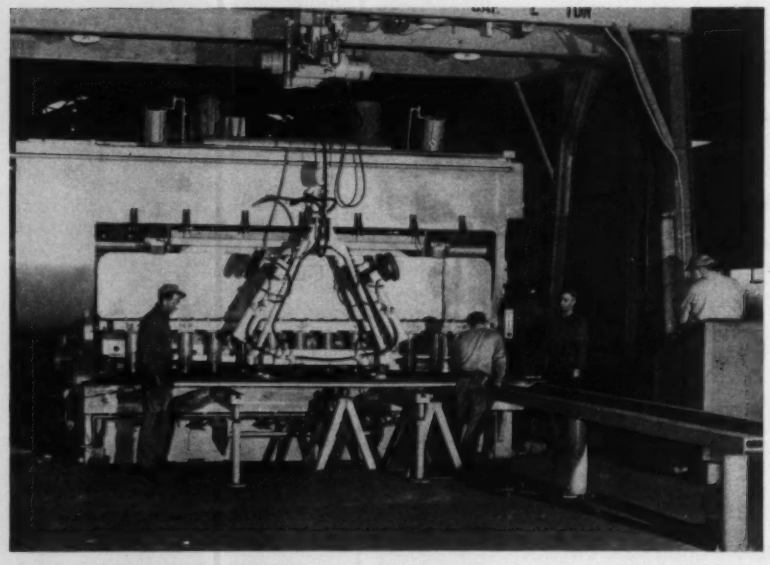
The shear, supplied by Steelweld Machinery Div., Cleveland Crane & Engineering Co., Cleveland, shears the thinnest sheets made by the company. It also cuts stainless steel plates as thick as 1 in., or 2 in. carbon steel plates.

The machine is accurate on all gages.

A quick adjustment prepares the shear for each plate size.

The company uses vacuum lifting equipment, mounted on a gantry above the shear bed, to handle sheets and plates weighing up to 4000 lb. The equipment, supplied by Vac-U-Lift Co., Salem, Ill., eliminates scratches on the annealed material.

New roller leveling equipment has been ordered for further improvement of product quality.



Vacuum handling equipment carries a plate from the company's new shear, which can cut thin sheets, stainless plates 1 in. thick, or 2 in. carbon steel sheets

• Pickling facilities include sodium hydride and acid baths.

The setup doubles the company's pickling capacity. And larger pieces can be processed in the sodium hydride bath.

Flat products are dipped in the sodium hydride bath, followed by a water quench. Then they are processed in a sulfuric acid bath and a nitric-hydrofluoric acid solution. The material is then water sprayed, dipped in a water rinse, and air dried.

The initial pickling operation—dipping in sodium hydride—loosens scale so acid pickling can be speeded, says Elmer I. Ghrist, general superintendent. For scale that is easily removed, the sodium hydride process can be bypassed.

Waste pickle liquor is pumped into storage tanks and hauled to a suitable disposal area by a contractor to keep from polluting streams in the area.

• Three electric arc melting furnaces are slated for replacement. A fourth furnace will be added for small heats.

The melt shop expansion is to be completed by the end of 1961. The 11 ft shells now used are to be replaced, one at a time, with new, 12 ft units that will turn out 15 to 16 ton heats.

An addition to the melt shop building—2000 sq ft of floor space—will accommodate a 9 ft electric arc furnace. The new unit will produce 7 to 8 tons of steel per heat. It will permit closer metallurgical control on tool steels and other high alloy, specialty grades.

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HERCULOY*
SILICON BRONZE CASTING ALLOY

Herculoy is an economical replacement for the costlier high tin content bronzes for many applications. It finishes to a rich golden color. Its strength is comparable to low and medium carbon steels. Its corrosion resistance is comparable to that of pure copper. Herculoy, with extremely low electrical conductivity, is also non-magnetic, easily worked hot, castable without the need for deoxidizing agents during melting. Write or call for new Herculoy literature: Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y. Telephone REctor 2-9500, or call your nearest Federated sales office.

*Patented by Revere Copper and Brass Incorporated; alloyed and marketed exclusively to the casting industry by Federated Metals Division.

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Among the thousands of "hardware" products manufactured by the A. B. Chance Company of Centralia, Mo., are eyebolt castings for the electrical industry. These castings require a tough, high strength, corrosion resistant material with low electrical conductivity. Herculoy provided this unique combination of properties.

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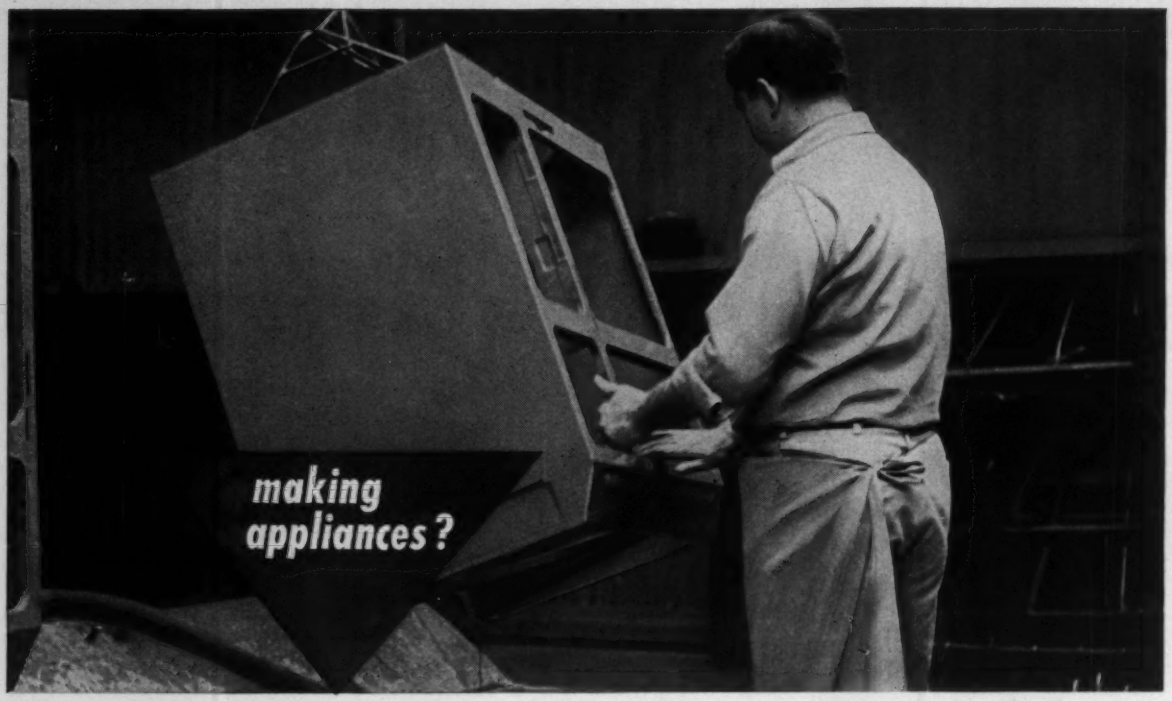

Pennsalt system approach makes finishing dollars go further

Ever take a close look at what your plant spends to prepare metal surfaces for finishing? As a typical appliance manufacturer, you'll spend $100,000 or more each year for metal preparation chemicals . . . and have several million dollars invested in the equipment in which they're used.

To get the most from this considerable investment, you need to be sure your machines and chemicals are working together. And that's what you get with Pennsalt's System Approach to metal surface preparation. Because Pennsalt supplies both the chemicals and the equipment, we can treat your metal finishing line as an integrated system . . . to make your investment pay off in peak production, top quality and low unit cost.

We make sure you keep getting top performance, too . . . with Pennsalt's Metal Preparation Service Plan. Our complete, personalized service, from a nationwide organization of experienced men, analyzes your metal preparation needs, recommends the right equipment and chemicals, aids installation and startup of automatic machines and follows up with regular service calls. Write for free booklet 342, "The Pennsalt Metal Preparation Service Plan."

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To Mill Tough, Superalloys, Match Settings, Hardness

Tests indicate that tools last longer in a comparatively narrow range of cutting speeds and feed per tooth. Hardness is an important factor in selection

THREE major factors have been found to be the causes of most trouble in machining high strength steels and thermal resistant alloys:

1. Abrasiveness. (It is determined by microconstituents in the metal.)
2. Temperature at the cutting edge of the tool.
3. Work hardening of the metal.

The first two are the most important on high strength steels; all three apply to stainless and high temperature alloys, the American Society of Tool & Manufacturing Engineers has been told by Norman Zlatin, vice president, Metcut Research Associates Inc., Cincinnati, and Robert T. Krueck, project engineer, Manufacturing Methods Division, Wright-Patterson Air Force Base, Ohio.

Medium Carbon Alloys

Milling, particularly face milling, doesn't present any particular problem in annealed, medium carbon alloy steels. But the going gets rough when they are quenched and tempered to something over Rc 43. For example, a normalized AISI 4340 (Rc 34 plus) can be face milled with a carbide tool at about 400 fpm. The same steel quenched and tempered to Rc 52 drops the cutting speed to 150 fpm.

In addition to cutting speed, feed per tooth is critical in milling such high hardness levels. Tool life data obtained by Messrs. Zlatin and Krueck show that a tooth feed of 0.005 in. per tooth (ipt) may give a tool life of 90 in. per tooth (down milling). At half that feed (0.0025 ipt), tool life is 20 in. and with an 0.010 in. feed, the life drops to 10 in.

In milling the harder steels, accurate grinding of face milling cutters is needed to minimize runout. (One with a 0.001 in. runout will turn out 25 per cent more parts than one having 0.003 in.) Hardnesses even slightly above Rc 49 considerably decrease tool life of high speed cutters. An increase of only 2 points in one test example decreased tool life from 58 in. of work travel to only 20 in. At 54 Rc, the metal was practically unmachinable.

Light speeds are recommended for hard, medium carbon steels. For example, a feed of 0.0015 ipt machined 70 in. of workpiece with a carbide end mill at a depth of 0.250 in. by 1.250 in. wide. At twice that feed, less than 5 in. can be cut.

When handling extremely hard AISI 4340 steels, a cutting speed of 50 fpm gives a carbide end mill 78 in. of metal machined before wearing out; upping the speed 20 per cent cuts tool life 25 per cent.

Austenitic Stainless

Work hardening tendencies of such steels make machining difficult. Recommended cutting speeds cover a wide range. Those for annealed 19-9 DL and solution treated A286 alloys are under 175 fpm with carbide regardless of the difference in hardness (Rb 94 and 91.5 respectively).

Messrs. Zlatin and Krueck recommend medium feeds—avoid light and heavy—in the range of 0.008 to 0.012 ipt. In end milling with high speed cutters, feeds ought to be between 0.0015 and 0.005 ipt.

Martensitic Stainless

In obtaining tool life curves, the investigators learned that a feed of 0.010 ipt will handle the face milling of AISI 410 and 422 with Carboloy. The feed must be reduced to 0.005 ipt on face milling a harder grade (Rc 44) of the 410 stainless to get a reasonable tool life.

Similar tests with high speed cutters also indicate that 50 per cent less cutting speed is necessary when increasing 410 stainless hardness from Rc 38 to Rc 45. The harder grade of 410 illustrates again the importance of feed—tool life in one test dropped a third when increased from an optimum 0.007 to 0.010 ipt.

Carbide cutters tend to chip if speeds over 0.001 ipt are used in end milling Rc 45 AISI 410 stainless. By using a T15 high speed steel, you may find 0.002 ipt satisfactory —an increase in cutting speed of 20 per cent can cut tool life in half.

Nickel Base Alloys

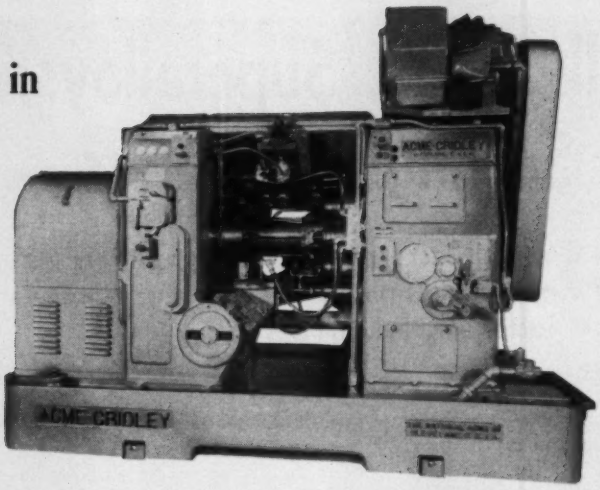
In general don't try carbide tools on the 40 to 65 per cent nickel, 13 to 18 per cent chromium alloys—they work harden too readily, causing premature tool breakdown, say Messrs. Zlatin and Krueck. T15 high speed steels are better.

Again, best cutting speeds are quite low: 20 to 40 fpm with the feed rate at 0.005 ipt. In end milling, feeds less than 0.001 ipt should be avoided—those between 0.001 and 0.002 ipt work best at 20 to 30 fpm.

Messrs. Zlatin and Krueck also presented several tables of data on feeds, speeds, and tool life for cutting and milling high strength, heat resistant alloys (including Vascojet, Udimet 500, Inconel 700, HS-25).

FOUR TRUNNION BEARINGS produced by Allis-Chalmers Mfg. Co., are for two grinding mills of the Puerto Rico Cement Corp., at San Juan, P.R. The bearings feature babbitted, continuously lubricated design, which reportedly corrects for minor misalignment

Major breakthrough in shaft production . . .



Acme-Gridley multiple-spindle shaft machine equals output of four automated lathes

At Chrysler Corporation's Trenton, Michigan, Engine Plant, a remarkable new National Acme shaft turning machine has slashed camshaft production costs; is hailed as a major production development for the entire industry. Performing complete shaft journal machining in a single set-up, this rugged 6-spindle automatic provides substantial savings in floor space and capital outlay, reduces scrap loss and enables closer control of machining operations.

Key to this dramatic pay-off are imaginative National Acme solutions to the difficult problems of centering, driving, and stabilizing the long, flexible shaft during turning operations. An ingenious part-holding technique exposes bearing journals for turning—an impossibility in a chucking set-up.

Extreme capability is stressed in the design of the Universal Multiple-Spindle Shaft Turning Machine and permits the maximum number of machining operations to be performed on straight or flanged shafts held between centers.

The shaft turning machine is additional evidence of National Acme know-how applied to the solution of special machining problems. This same insight and ability is available to any manufacturer interested in reduced costs and increased production. Our representative is as close as your telephone.

National Acme's "Zone of Responsibility" includes all phases of cost reduction. Check YOURS . . . Then Check National Acme

Direct Costs: these include direct dollar savings as realized by Chrysler Corporation . . . an "everyday" job for Acme-Gridleys. **Indirect Costs:** effecting important savings in maintenance, downtime, scrap reduction, tool costs, etc. **Product Redesign:** teaming with your design group to take full advantage of Acme-Gridleys' cost reducing capabilities. **Direct Material Costs:** our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems. **Make-or-Buy Reviews:** in many cases our Contract Division can assume your production headaches and relieve you of immediate capital investment. **Spot Modernization:** pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.

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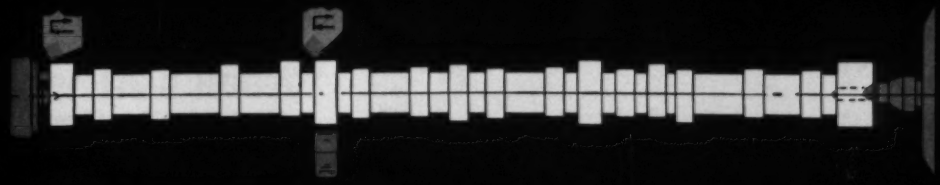
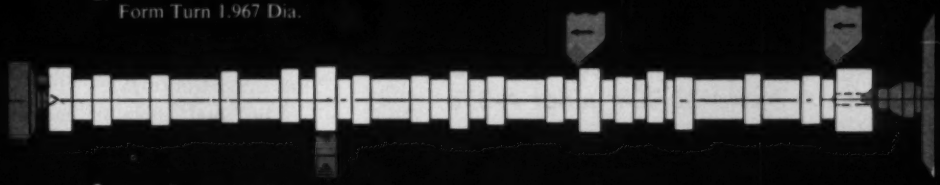
1st position—load and unload



2. Form Turn 1.951 Dia.
Form Turn 1.967 Dia.

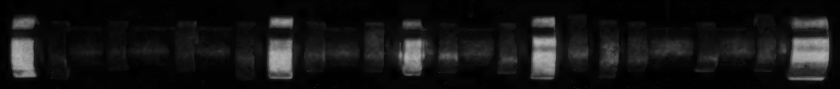


3. Form Turn 1.982 Dia.
Form Turn 1.998 Dia.
Support on 1.967 Dia.

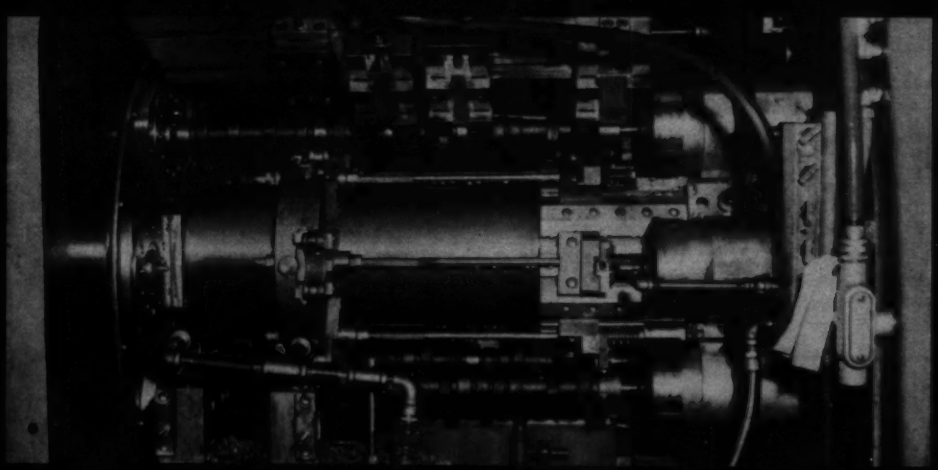
4. Chamfer O.D. of 1.951 Dia.
Chamfer O.D. of 1.967 Dia.
Face Sides of 1.743 Dia.
Support on 1.967 Dia.

5. Face End of Camshaft
Relieve Turn 1.743 Gear Dia.
Support on 1.967 Dia.

6. Chamfer O.D. of 1.743 Dia.
Chamfer O.D. of 1.982 Dia.
Chamfer O.D. of 1.998 Dia.
Support on 1.967 Dia.



High-test cast iron camshaft with journal machining completed . . .
13 operations in 22 seconds.



Close-up of tooling zone. Open spindle in load and unload position shows unique centering, holding and driving mechanism.

ASTM Expected to Adopt Spec Upping Yield Strength

New A-36 designation would boost minimum to 36,000 psi for carbon structural steel for many applications compared with 33,000 psi under A-7 and 32,000 under A-373

AFTER three and one-half years of being buffeted in committee, a new specification for carbon structural steel appears to stand a good chance of being adopted this week at the annual meeting of the American Society for Testing Materials.

The new specification, A-36, is similar to the A-7 and A-373 designations. All three cover carbon steel plates, shapes, and bars of structural quality for use in the construction of bridges, buildings, and general structural purposes.

The most significant change is the upgrading of the minimum yield point: 36,000 psi compared with 33,000 psi for A-7 and 32,000 psi for A-373.

To appreciate other differences, comments J. R. LeCron, metallurgical engineer, Bethlehem Steel Corp., it is necessary to compare the three.

Applications of A-36 and A-373 are limited to structural members not over 4 in. thick. (It is necessary to limit thickness so that the maximum chemistry can also be held to the lowest practical limit.) And of the three, A-373 is the only material recommended for welded construction.

Tensile strength ranges (see exhibit) overlap and ductility requirements are almost identical. The proposed A-36 specification has a maximum tensile strength 5000 psi higher than A-7 and A-373 because of the higher yield point that must be realized.

• **Matches A-373 in Chemistry**—A-36 has a maximum carbon of 0.28 per cent prescribed for all products in all thicknesses. A-373 calls for the same maximum in all sizes and shapes (exception: Carbon for plate ranges 0.25 to 0.27 per cent depending upon thickness).

The total effect of carbon and manganese is almost identical in bars and shapes. In plates, the chemistry for A-36 is somewhat higher, particularly in thicknesses over ¾ in.

• **Birth of a Specification**—The original proposal submitted by the American Institute of Steel Construction's Committee on Specifications asked that Specification A-7 be revised.

The committee asked ASTM to raise the minimum specified yield point called for in A-7 steel to 39,000 psi, if practical.

The problem was given to Subcommittee 11 of ASTM's Committee A-1 to explore and resolve. The initial response was largely against upgrading.

Reluctance from several quarters continued to hold up action on the change.

Examples: Railroad builders were fearful of losing some of the ductility associated with a 33,000 psi yield point; others felt the advantage of higher strength would be offset by higher costs of the material; another committee flatly stated that it would not go along with any change even if accepted.

As a result of the objections, it seemed best to present the higher yield recommendation as a new ASTM Specification A-36.

That weakened the resistance. In a poll of the membership (about 50), only five of the returns were negative. The objection was to a reference in the scope clause of the specification indicating that the material was recommended for welded construction. After deleting that reference and making other revisions, the new specification was unanimously endorsed. A-36 now awaits approval of Committee A-1 at this week's meeting, and the Committee of Administration Standards 30 days later.

Comparison of Three Structural Steel Specifications

	TENSILE REQUIREMENTS		
	A-7	A-36	A-373
Tensile strength, psi: For shapes of all thicknesses	60,000 to 75,000	60,000 to 80,000	58,000 to 75,000
For plates and bars up to 1½ in., incl. in thickness	60,000 to 72,000		
For plates and bars over 1½ in., in thickness	60,000 to 75,000		
Yield Point, min, psi	33,000	36,000	32,000
Elongation in 8 in., min, per cent	21	20	21
Elongation in 2 in., min, per cent	24	23	24

Is Flat Weld Wire Better Than Round?

FLAT weld wire is better than round, especially in semiautomatic and automatic CO_2 welding systems, believes Page Steel & Wire Div., American Chain & Cable Co. Inc., Bridgeport, Conn.

Participants at the Los Angeles welding show learned that intensive tests demonstrate these advantages of flat wire:

- Electrical contact between wire and welding head is much improved.
- Wire feed through rolls in head is much smoother.
- Wandering of welding wire is eliminated.
- By adjusting the angle of flat side to direction of travel, operators can get great flexibility in deposit geometry—from deep and narrow to flat, shallow, and wide.
- Increased wire cost (25 per cent) is adequately offset by the improvements gained.

• Why is a flat wire better? Several reasons are cited.

To widen a bead, the operator must oscillate or weave the electrode. By positioning the long axis perpendicular to direction of travel, deposits are wide and have a brush effect at either side of the electrode path.

By putting the long side of the flat wire parallel with direction of travel, you can get the same effect as an infinite number of fine round wires in tandem traveling along the weld groove. The problem of coordinating speed and travel of two heads is eliminated. The arc moving from end to end of the thin rectangle (wire cross section) produces a turbulence in the molten metal that boils out gases and impurities. Welds are said to be much cleaner and more easily controlled.

American Chain & Cable used a 0.094 in. by 0.034 in. standard welding wire with normal current, voltage, feed speed, and gas flow to join SAE 1015.

A standard 0.505 specimen showed these results: Ultimate strength, 75,000 psi; yield, 56,800; elongation in 2 in., 34 per cent.

Dry duplication process reproduces open hearth reports in seconds at Inland Steel's Indiana Harbor Works. The previous method, hand copying, took 10 minutes

Copiers Cut Clerical Time

REPRODUCTION of heat reports with electric copying machines is saving clerical manhours in the No. 2 and No. 3 open hearth shops at Indiana Harbor Works, Inland Steel Co., East Chicago, Ind.

The machines, called Thermo-Fax, were supplied by Minnesota Mining & Mfg. Co., St. Paul.

• The units take less than a minute to duplicate work that required 10 minutes for hand copying.

All details of the heat from tap to tap (including weight and type of raw materials, when scrap was charged, when additions were made, and when the furnace was tapped) are written on the heat report by the scrap weigher, melter, and pit foreman. The report is sent to a production clerk, who determines final totals and percentages.

Four copies of each report are made in the department's copying machine. Duplicates are sent to the main laboratory, the accounting department, manager of steel production, and the open hearth superintendent. The original is filed in the production clerk's office.

• The copiers are used constantly; other departments use them to copy letters and other documents when they aren't busy with open hearth paperwork.

No special training is needed to use the machines. The operator presses a button, inserts the copy paper and document to be copied, and has the completed facsimile in a few seconds.

Copying machines also eliminate paperwork bottlenecks in other offices and mills throughout the works.

"Call FOSTER for track... PLUS"

Whether you call for a big shipment of "high iron" or a single guard rail, Foster gives you track "plus"—all the rail you need, and all the accessories and tools to complete the job.

You can get any standard rail sections including lower-cost Foster Quality Relayers, frogs, switches, tie-plates, accessories, tool cars and dollies, hand tools, gauges, levels and other track items including CRANE RAIL. We will also supply steel-sheet piling and construction products for maintenance-of-way.

Another "plus": Foster's warehouses are located all over the country, all carry large stocks. So you get the advantage of "complete package" shipments, lower freight rates, prompt deliveries. For assistance in ordering, call the Foster Track Specialist near you.

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Los Angeles 5 • Atlanta 8 • Cleveland 35

Faster From Foster

Pipe · Piling · Rail

Hot Patch System Extends Campaigns

Open hearth roofs, uptakes, walls, and skews are repaired with a water mix refractory

PROPER application of hot patches can help steelmakers get more heats per campaign from all-basic open hearth furnaces, says Harbison-Walker Refractories Co., Pittsburgh.

A slurry mix, mixer, and gun combination developed by the company is said to permit gradual, uniform application of patching material to basic roofs, back walls, port skews, front walls, and uptakes.

• **The Mix and Mixer** — The fine ground refractory material is supplied in a chrome or chrome-magnesite base. Both types form bonds rapidly and develop high strength when properly applied, Harbison-Walker says.

The material is mixed in a tank by electrically driven paddles. A steam jacket attachment helps activate plasticizers, insuring good adherence.

The equipment mixes 4500 lb of ground refractory material with 150 gallons of water in about 30 minutes.

• **How to Apply Patches** — The pressure type gun is filled by gravity from the mixer. It holds about 1500 lb of slurry.

The gun is placed in front of the furnace with a lift truck and connected to an 80 psi air source. Patch material is sprayed through a 1 in. pipe. Two men can apply a 1500 lb batch of material in about 10 minutes.

• **Other Applications**—The patching mix can be used for maintaining suspended-end construction below the furnace floor and for sealing end walls or front walls, reducing air infiltration, the company reports.

It can also be used for maintenance of nonferrous furnaces. Example: It has been applied to side walls and other parts of copper refining furnaces that are exposed to severe erosion.

Industrial Pushbutton Size Cut 40 Per Cent

MINIATURE, industrial, oiltight pushbuttons now available permit at least a 40 per cent reduction in panel space requirements. The units can be placed as close as 1¼ in. apart in a ⅞ in. mounting hole with locking notch. Heavy duty units need to be placed at least 2¼ in. apart.

The miniature line offers the operating and functional forms available in heavy duty construction from General Electric's General Purpose Control Dept.

These include pushbuttons (with or without guard), mushroom head buttons, selector switches, illuminated pushbuttons, illuminated mushroom head buttons, transformer type indicating lights, and push to test indicating lights.

Pressure type terminations are provided for push-on connectors. These terminations help assure positive and troublefree connections. The line includes retaining rings in six different colors to permit easy changes in color coding. A variety of engraved or blank nameplates are available in two sizes (1¼ x 1¼ in. or 1¼ x 1½ in.).

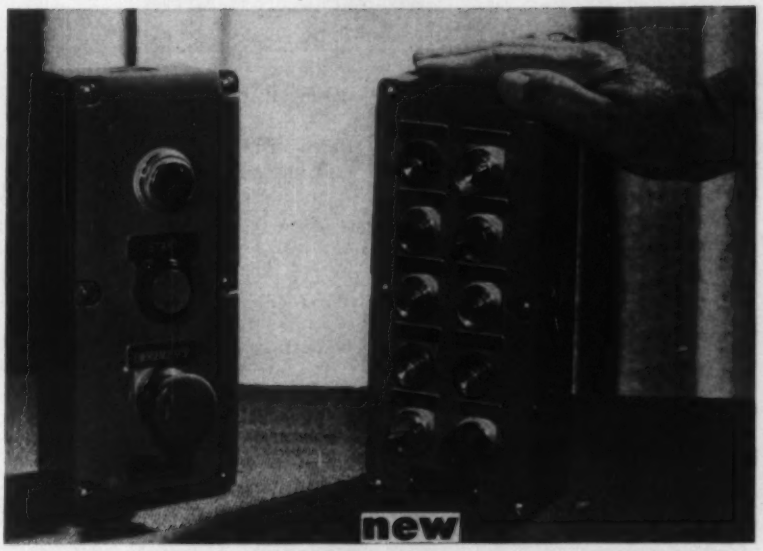
Standard size name plates accommodate one line of 12 7/64th characters. In the jumbo size, you can get two lines of 14 7/64 characters. Blank or specially engraved nameplates are available.

You can get illuminated forms in six colors. An encapsulated transformer for the lights has separate, insulated secondary winding. Encapsulation protects the transformer coils from mechanical damage.

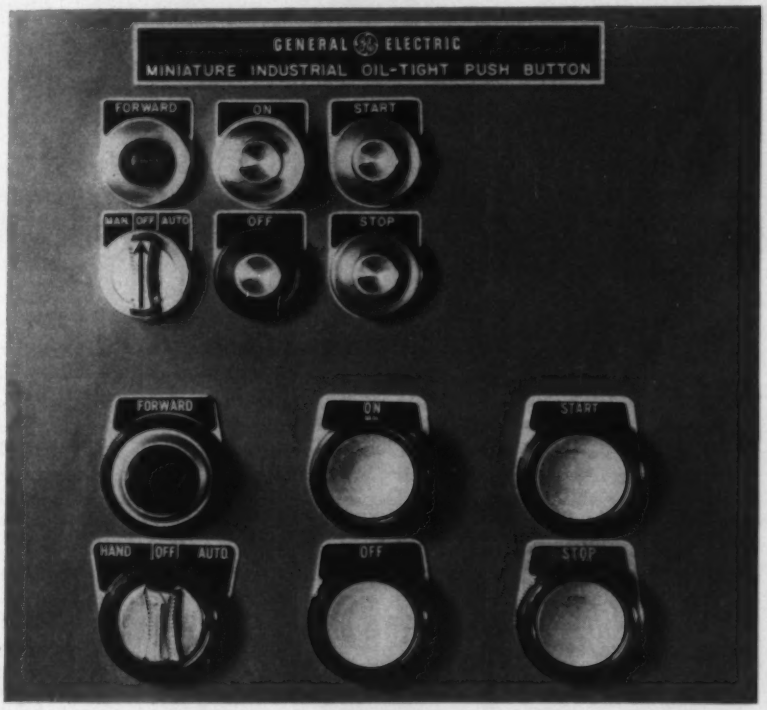
All units are oiltight and suitable for use where cutting fluids and coolants are present or in dirty environments. Synthetic rubber seals and washers keep out oil and other foreign materials.

The line meets applicable standards of NEMA, NMTBA, and JIC for oiltight pushbuttons. Double break, fine silver contacts are used.

The units will accept two No. 14



The pendant control labeled "new" shows the size relationship of the miniature pushbuttons with the conventional units on the left. The manufacturer claims at least a 40 per cent size reduction. A complete line is available



The smaller, more compact set of pushbuttons at the top illustrates how space can be saved on equipment consoles. They can be mounted 1¼ in. apart

through No. 22 wires per termination or one No. 10-12 (or AMP or Kent 0.250 x 0.032 terminal).

For further information, *write* General Electric Co., Schenectady 5, N. Y.

Plastic Emulsion Protects Metals, Glass, Plastics

YOU CAN protect smooth and wrinkled metal finishes, stainless steel, polished aluminum, dials, nameplates, glass, and plastic surfaces with Strip-Kote. The material can be applied by brush and spray gun and becomes transparent when dry. The dry film is flexible.

The milky colored plastic emulsion contains no flammable solvents. One gallon will produce a 0.004 in. thick coating over 500 sq ft.

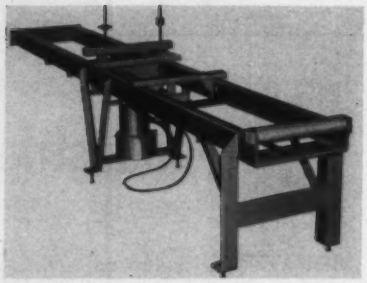
For further information, *write* Chemical Consulting Service, 3711 S. Clement Ave., Milwaukee 7, Wis.

Bar Feed Attachment Has Hydraulic Drive

YOU CAN get a heavy duty, automatic bar feed unit for three models of metal cutting bandsaws (W-9, F-14, and J-24). The unit (designated BFH-24) is self-contained and has a hydraulic drive.

It can be set up in a few minutes to feed stock for duplicate cuts of identical length and need not be removed for hand operation of the saw. The unit can feed a 10 ft bar in automatic cycles with a maximum of 14 in. per cut without resetting.

It's 10 ft long and 2 ft wide. Bed height is adjustable from 25 to 26 in.



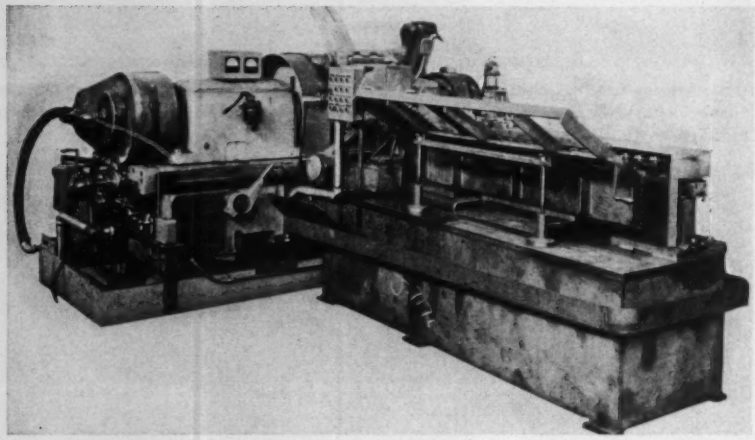
For further information, *write* W. F. Wells & Son Inc., Three Rivers, Mich.

High Alumina Bricks Resist Molten Aluminum

YOU CAN get two types of bricks and a companion mortar that are highly resistant to molten aluminum and aluminum alloys. Both are high aluminum types with a low silica content.

One, called Lo-Sil Superbrick, is recommended for furnace hearths that must withstand the most severe conditions, or are used to produce high quality metal. The other, called Lo-Sil, is for less severe conditions. A high aluminum mortar, Lo-Sil mortar, can be used with either type of brick.

For further information, *write* Kaiser Refractories & Chemicals Div., Kaiser Aluminum & Chemical Corp., 300 Lakeside Drive, Oakland 12, Calif.



Grinder Feeds Various Sizes in a Run

UP TO 5 cu in. of stock per minute were removed in production tests of a new chain feed, double disc grinder. The unit is rigid, has positive spindle feed, and is equipped with 50 hp spindle drive motors.

The chain feed mechanism uses a disappearing link principle that permits a variety of part sizes to be fed into the machine without adjustment or change in the loading and feeding mechanism. Closely spaced drive links drop into neutral position when interference pressure from the part is applied, leaving any free succeeding links to drive the part.

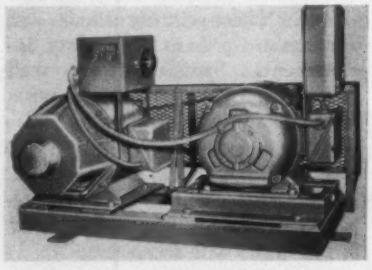
The unit removes 0.015 in. of 1045 steel in one pass at a feed rate of 8 ft per minute. Size is held to 0.002 in. and parallelism end to end or side to side is held to 0.001.

A dial indicates when wheel wear approaches size limit. To compensate for wear, a ratchet operated feed, powered by an air cylinder, can be actuated manually.

For further information, *write* Mattison Machine Works, 200 Blackhawk Park Ave., Rockford, Ill.

Alternators Produce 360 to 3300 Cycle Range

A LINE of high frequency motor alternators has been designed for economical high cycle current beyond the practical range of frequency converters. In addition to nine basic models (ranging 1 to 7.5



it's yours in the Niagara line:

A BIGGER PRESSFUL OF PERFORMANCE

- Rigidly built, all-steel frames of patented, triple box section design.
- Box-type, welded steel slides reinforced with heavy webbing.
- Extra-long, adjustable gibs that fully contain the slide during working stroke.
- Laminated, non-metallic ways . . . an exclusive Niagara press feature to prevent scoring.
- Low-inertia pneumatic friction clutch and brake for trouble-free, high production.
- Centralized pressure lubrication.
- Operating controls conveniently arranged on master panel.
- Unusually liberal shutheight and extremely long slide adjustment to accommodate a wide range of stamping and forming dies.

TWO-IN-ONE FLEXIBILITY

Here's a 250-ton Niagara Straight Side Double Crank Press, at contract metal stamping plant of Belmet Products, Inc., equipped with:

1 Roll feeds for progressive die work on coil stock.

2 Nine-station transfer feed mechanism and dies for work with pre-cut blanks . . . quickly removable as a self-contained unit.

Progressive die stamping . . . deep drawing . . . heavy blanking . . . lamination punching . . . you name it! Niagara Straight Side Single and Double Crank Presses are the profitable choice for numerous stamping requirements. No other line can match them in the middle capacity range. Once you've checked their operating and structural features, it's easy to see why.

Built in a combined range of 50 through 500-ton capacities, Niagara Series SC-1 and SC-2 Presses are available in non-geared, single geared or double geared models, with either single or twin-end drives. All can be outfitted with automatic feeds, adjustable speed drives, pneumatic die cushions, special controls and devices for automation.

Learn how you can get "a bigger pressful of performance." Be prepared for the next time you buy a straight side — single crank or double crank. Write for illustrated Bulletin 64. *Niagara Machine & Tool Works, Buffalo 11, N. Y., District Offices and Distributors Everywhere.*

NIAGARA straight side presses

SINGLE AND DOUBLE CRANK

MODERN MACHINE TOOLS — MMT — PRODUCTION EFFICIENCY

America's m[illegible] complete line [illegible] presses, press brakes, shears, other machines and tools for plate and sheet metal work.

kva and producing 360 to 3300 cycles) ratings and frequencies can be tailored to meet customers' requests.

The alternator assembly has a high frequency alternator, a silicon rectifier unit with time delay fuses for field excitation, and a Robbins & Myers drive motor. Revolving field construction is used in ratings of 1500 cycles and lower. A brushless inductor type is supplied for ratings over 1500 cycles to accommodate higher operating speeds.

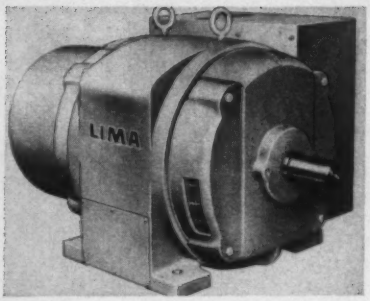
For further information, *write* Industrial Motor Div., Springfield, Ohio, Robbins & Myers Inc.

Generators Rated from 5 kw Through 100 kw

A LINE of ac generators and motor-generators is available in ratings from 5 through 100 kw.

Precise Power models have open type construction with static exciter regulators. You can get inherent regulation to ±10 per cent or magnetic amplifier regulation to ±1 per cent.

Special Brushless ac generators



have dripproof construction and are adaptable for engine mounting or direct coupling to the driving motor. Synchronous generators are equipped with induction exciter regulators and have inherent regulation with no external controls.

Totally enclosed, fan cooled types are rated at 5 kw at 1800 rpm through 50 kw at 1800 rpm. Custom designs can be specified.

For further information, *write* Dept. 149, Lima Electric Motor Co. Inc., Lima, Ohio.

Battery Powered Magnet Carries 8000 lb Loads

A SELF-contained, battery powered lift magnet has a lift capacity of 8000 lb. The unit is powered by automotive wet cell batteries in the magnet case and has no electrical cords to restrict the length of haul.

A remote control is available for such things as handling large parts or for operating the magnets from the driver's seat of a lift truck. The recessed control panel (on the magnet) has an operating switch, a dial ammeter, and polarized receptacle for a trickle charging plug.

For further information, *write* Sundstrand-American Broach, a division of Sundstrand Corp., Ann Arbor, Mich.

Hydraulic Cylinders Have 1 to 8 in. Bore Sizes

A LINE of power cylinders (Series L) is designed for use with 1000-psi pumps. The cylinders are available in bore sizes of 1 through 8 in.

They have square head and tie-rod design and use case hardened and chromium plated piston rods. You can choose from 14 different mountings.

For further information, *write* Dept. 124, Power Cylinder Div., Hannifin Co., 501 S. Wolf Rd., Des Plaines, Ill.

Material Is Used to Coat Vacuum Metallized Parts

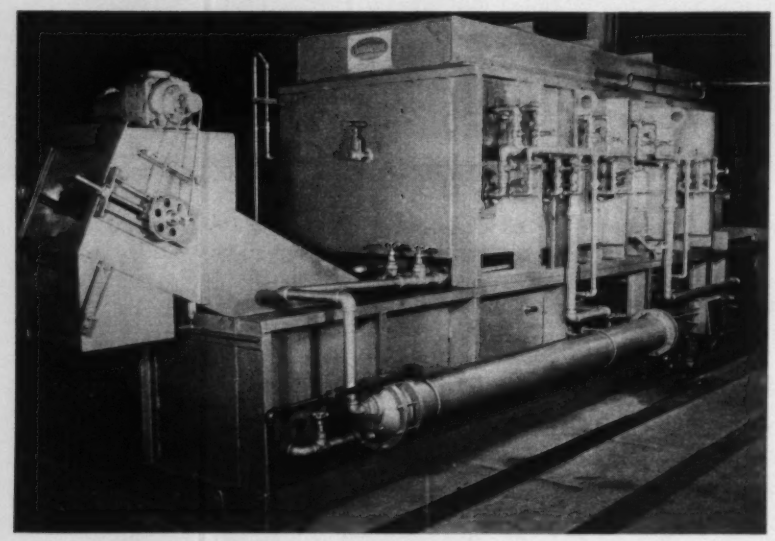
A THERMAL set coating for use on polystyrene, acrylic, phenolic, and other plastic materials being vacuum metallized is available from John L. Armitage & Co.

The coating is applied by dipping or spraying. The base coat is baked 1 hour at 150° F; the product is then vacuum metallized; and the top coat is applied to the base for another hour at 150° F.

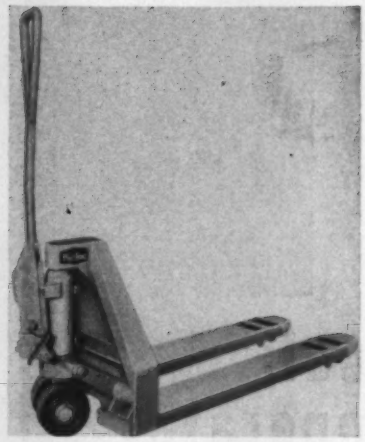
For further information, *write* John L. Armitage & Co., 245 Thomas St., Newark 5, N. J.

Hydraulic Pallet Truck Has 2200 lb Capacity

AN economy model has been added to a line of hydraulic hand pallet trucks made by Raymond Corp. The model comes in 21 and 27 in. widths with fork lengths of 32, 36,



FOR HEAT TREATING AND QUENCHING, this automatic shuffle hearth furnace does the job with continuous atmosphere. It can be used for hardening and carbonitriding within an operating range of 1400 to 1800° F. The unit is adaptable to processing small parts such as fasteners, nails, and bearing parts. For further information, **write** Sunbeam Equipment Corp., 180 Mercer St., Meadville, Pa.



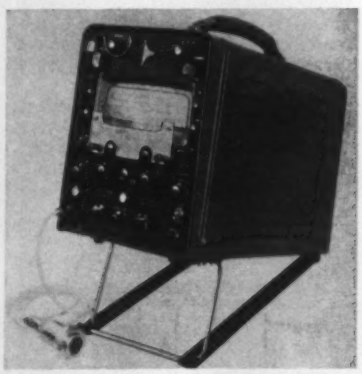
42, and 48 in. It has a capacity of 2200 lb.

The forks are raised by pumping the towing handle. A pressure sensitive pedal permits fast or slow lowering. The unit has a total lift of 4½ in.

For further information, *write* Raymond Corp., 91-182 Madison St., Greene, N. Y.

Ultrasonic Unit Does Nondestructive Testing

WITH THE Model CM100 tester you can work with metals, plastics, ceramics, and other materials which can support ultrasonic waves. Uses include surface or internal flaw detection, thickness measurement from one side, and determination of physical and structural properties.

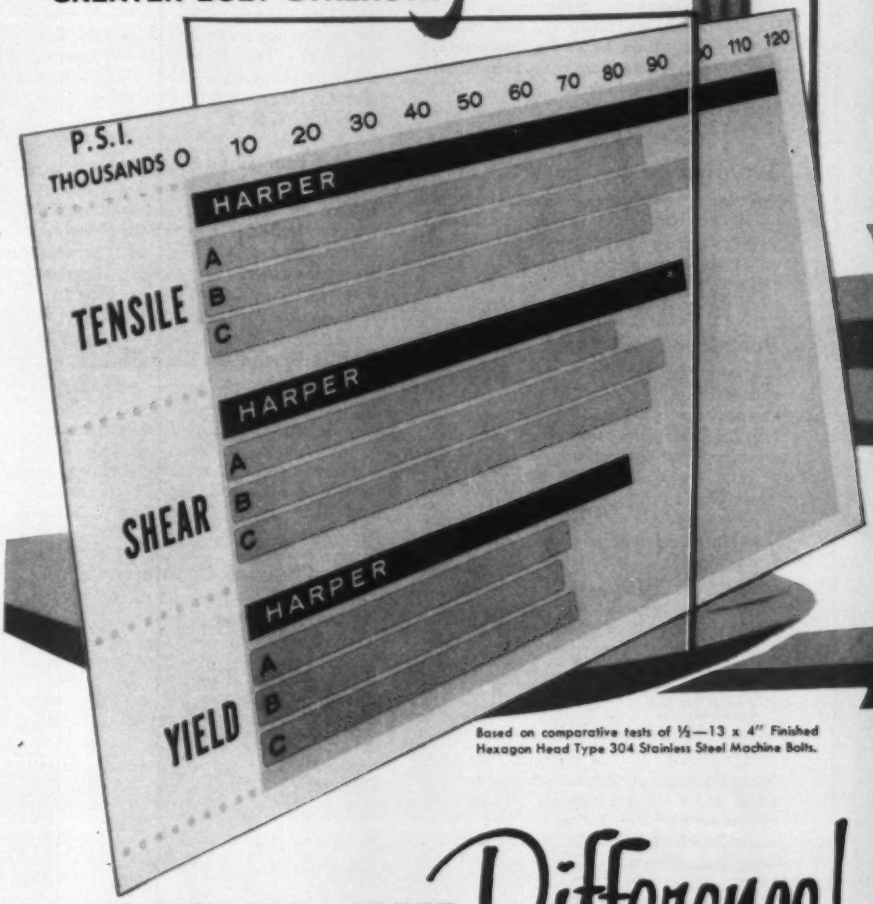


The portable unit is designed for in-plant application and can be used with any common plant power supply. Accessories are available.

For further information, *write* Circo Ultrasonic Corp., 51 Terminal Ave., Clark, N. J.

Weigh the facts

OF HARPER'S GREATER BOLT STRENGTH



Based on comparative tests of ½—13 x 4" Finished Hexagon Head Type 304 Stainless Steel Machine Bolts.

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Substantiated proof of Harper's great bolt strength was made by the Robert W. Hunt Company, in an unbiased test of Harper's products and three other manufacturers. Tests showed that Harper products had 35% greater tensile, 15% greater shear and 26% greater yield strength. This great strength, when added to the corrosion-resistant qualities of every Harper fastening, gives you the best that money can buy. It means increased service life and customer satisfaction. It also means *another Harper difference* to build goodwill for you and your products! See the yellow pages for your nearest distributor.

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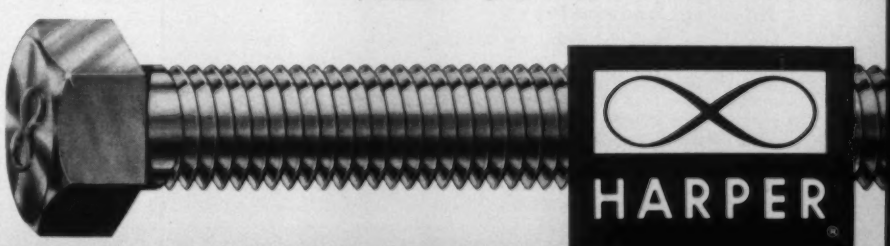


NEW literature

Write directly to the company for a copy

Refractory Metal Chart

A chart shows the properties of tungsten, tantalum, molybdenum, and columbium. The listing facilitates comparison. On the reverse side is shown a Fahrenheit-Centigrade conversion chart. Dept. SL-3, Metals & Fabrication Div., Fansteel Metallurgical Corp., North Chicago, Ill.

Servosystem Design

A four page brochure describes a simplified procedure and calculations needed to obtain optimum performance from second and third order servosystems. Applications & Sales Dept., M. Ten Bosch Inc., 80 Wheeler Ave., Pleasantville, N. Y.

Vanadium Tool Steel

A pamphlet describes a water hardening, vanadium tool steel (UHB 19-VA) developed for cold heading. It gives details on forging, stress relieving, hardening, tempering, and annealing. Uddeholm Co. of America Inc., 155 E. 44th St., New York, N. Y.

Prefinished Metals

An eight page report ("Fabricating Qualities of Prefinished Metals") contains information about using preplated materials to streamline factory procedures. Results of part forming research are presented. Dept. SL-3, Apollo Metal Works, Clearing Station, Chicago 38, Ill.

Alloy Handbook

"Handbook of the Alloyist" discusses several groups of alloys used in the electrical and electronic industry. Typical applications are given for each alloy. Riverside-Alloy Metal Div., H. K. Porter Company Inc., Riverside, N. J.

Titanium Fabrication

"Titanium Facts" catalogs various types of titanium and titanium alloys with their commercial and military code designations, metallurgical properties, and other technical data. Welding methods are also described. Nooter Corp., 1400 S. Third St., St. Louis 66, Mo.

Water Emulsion Paint

"Zinc Oxide in Water Emulsion Paint Systems" discusses the use of zinc oxide in latex paint. The book includes color pictures of exposure tests, showing surfaces protected with paint formulated with and without zinc oxide. Chemicals & Metals Div., Eagle-Picher Co., Cincinnati 1, Ohio.

Handling Isocyanates

A 15-page booklet describes the handling and storage requirements for isocyanates. It explains the methods for unloading tank cars and tank trucks, handling drums, constructing storage tanks and transfer lines, cleaning storage tanks, and disposing of spillage. In addition it discusses recommendations for temperature and moisture control, health hazards, first aid, safety, and ventilation. National Aniline Div., Allied Chemical Corp., 40 Rector St., New York 6, N. Y.

Vibration Control

A guide to writing vibration and noise control specifications for air conditioning and related equipment is designated Bulletin F2D. The six page guide discusses selection of resilient mountings. Korfund Co. Inc., 48-40E 32nd Place, Long Island City 1, N. Y.

Tool Steel Guide

A 28-page bulletin lists tool steels according to AISI-SAE classifications. It includes an index reference and includes tradenames, classifications, and numbers. Peninsular Steel Co., 24401 Groesbeck Highway, P. O. Box 3853, Detroit 5, Mich.

Coolants and Cutting Fluids

Brochure No. 460B shows how machining or grinding operations are affected by the cutting fluid or coolant used. It discusses coolants and cutting fluids used in machining, grinding, drilling, and many other metal cutting operations. Master Chemical Corp., 11 N. Huron St., Toledo 1, Ohio.

Sales Manual Development

A 12-page booklet, "How to Develop a Good Sales Manual," includes sections on how to begin collecting information, what to include, how to develop subjects, how to divide the work among subordinates, and how to make sure the finished manual will be used. The material is comprehensive but not associated with a specific business. Heinn Co., 326 W. Florida St., Milwaukee 4, Wis.

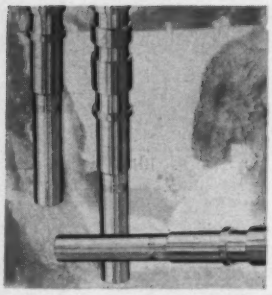
NEW BOOKS

Standards of the Tubular Exchanger Manufacturers Association, published by TEMA, 53 Park Place, New York 7, N. Y., 144 pages, $6 ($7 to a foreign address)

Detailed information is presented on the design and engineering of tubular heat exchangers. In addition to outlining the mechanical standards for Class R and Class C exchangers, the standards include thermal data, material specifications, and general design information.

Welded Interstate Highway Bridges, edited by James G. Clark, James F. Lincoln Arc Welding Foundation, Box 3035, Cleveland 17, Ohio, 269 pages, $2

Savings in material, labor, time, and other items of cost are discussed. The book also covers the possibility of making structures more attractive through welding. The editor says the designs in the booklet present a cross section of the best current practice in bridge construction for the defense and interstate highway system.



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Your J&L distributor can reduce your costs by providing a complete range of pre-production services, and doing it economically! He can save you the capital investment required to maintain long term inventories; he can help you eliminate the costs of overhead connected with stocking, accounting, and the inevitable losses incurred through waste and obsolescence due to specification changes.

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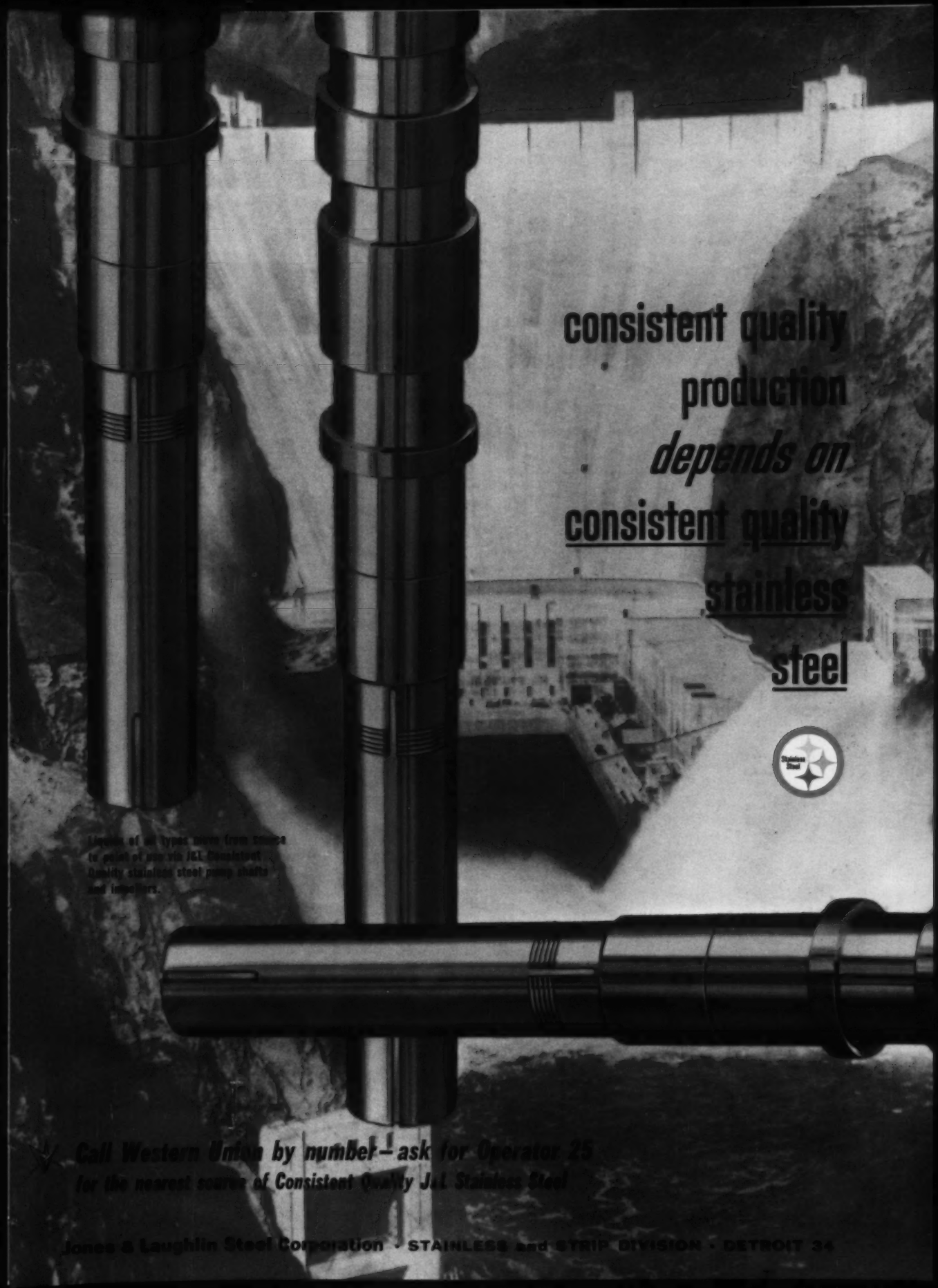
Even when advanced research is required you can call on your J&L distributor in confidence. He will be happy to discuss your problem because he knows he is backed by one of the world's most respected teams of metallurgists—J&L's own staff in laboratories at Detroit and the famous Graham Research Laboratories at Pittsburgh.

Your J&L distributor is as near as your telephone. Call Western Union Operator 25 for the name of your J&L distributor of Consistent Quality stainless steel.

J&L — a leading producer of stainless steel and precision cold rolled strip steels

STAINLESS

SHEET • STRIP • BAR • WIRE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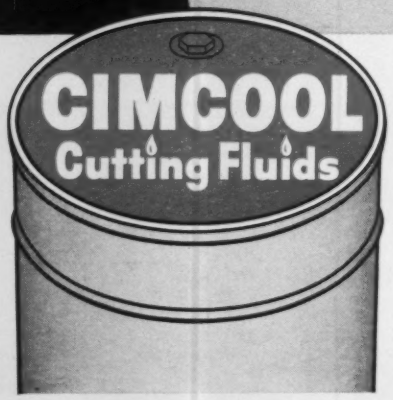
FLEXIBILITY--plus rust control!

Here's the latest on-the-job report on CIMCOOL, the world's largest-selling chemical cutting fluid! (Company name on request.)

SALES REPORT
2.
make air compressor and pneumatic equipment, working mostly on cast, ductile and malleable iron.
Cimcool S2 with Cimplus completely solved bad rust problems they once had. For 10 years they've used Cimcool at dilutions from 1:15 to 1:80 and get perfect cutting action and rust control.
They pre-mix at central control points within each department. They like Cimcool's flexibility, because they can get the specific dilution a particular operation calls for.
Herb Whitacre
Cleveland Office



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Steel Industry Capacities

Want to know how much steel can be finished, or who has the finishing and other production facilities? This 16 page report will tell you

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FOR the first time in three years, steel finishing capacities for the U. S. and Canada have been compiled and reported publicly by the American Iron & Steel Institute.

They appear in the 520 page, 1960 *Directory of Iron & Steel Works of the United States and Canada.* The last such directory was issued in 1957.

The new edition, while giving capacities as of Jan. 1, 1960, includes new facilities that began operating during the first quarter of this year.

Although capacities for production of coke, pig iron, and steel ingots are compiled and reported yearly, a compilation of finishing capacities is made only once every three years because of the enormity of the task.

In addition to carrying the triennial tables of finishing capacities, the directory gives a company by company listing of steel producing and finishing facilities, as well as the annual figures on capacities to produce coke, pig iron, and steel ingots.

In the following 15 pages, STEEL reproduces the directory's tables on finishing and producing capacities, carries a list of steel company names and addresses, and provides several tables to show trends in steel finishing capacities.

The three year span covers the completion period for the big round of steel industry expansion started in 1955.

In the three years (1957, 1958, and 1959), the steel industry's expenditures for new equipment and construction totaled $3,815,000,000. The 1957 outlay of $1,722,997,894 was a record. Expenditures in 1958 were $1,130,961,187; in 1959, $961,000,000. Expected amount in 1960 is $1.6 billion.

Many people use melting capacity figures as a measure of steel industry growth, but melting capacity is useless unless it is backed up by sufficient finishing capacity. The institute's new report shows that hot rolling capacity has kept up. On Jan. 1, 1960, the industry's hot rolling capacity of 113,785,590 net tons was equal to 76.6 per cent of the ingot capacity. Three years earlier, the 103,022,230 tons of hot rolling capacity was equal to 77.2 per cent of the ingot capacity.

The long time trend toward increased use of light, flat rolled products is reflected in the finishing capacities. The biggest single increase in hot rolling capacities was in hot rolled sheets. They accounted for a little more than half of all the three-year increase. Similarly, cold rolled sheets were the biggest gainer of capacity in the cold finished products.

Finishing capacities were not increased across the board. Reductions were made for some products, primarily railroad and merchant wire goods.

Twenty-nine states now have steelmaking furnaces, 18 have blast furnaces, and 30 (including Hawaii) have facilities for hot rolling steel.

An extra copy of this 16-page section is available until supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Finished Steel

U. S. CAPACITY to hot roll steel climbed 10.4 per cent in the three years ended Jan. 1, 1960. The growth was about in line with this period's 11.3 per cent expansion in the nation's ingot capacity.

Hot rolling capacity rose from 103,022,230 net tons on Jan. 1, 1957, to 113,785,590 tons on Jan. 1, 1960—an increase of 10,763,360 tons.

Biggest gainer of finishing capacity was hot rolled sheets, the increase being 5,983,400 net tons.

In the cold finished products, cold rolled sheets racked up the biggest tonnage gains in capacity. They increased by 2,705,090 tons.

Not all products had gains. Some of them, particularly railroad and merchant wire, sustained losses.

Hot Rolled Steel Capacity by Products and Companies

Products	Annual Capacity Net Tons
Rails—Standard, over 60 lbs. per yard	1,395,600
" —60 lbs. or less per yard	109,940
Long joint or splice bars and tie plate bars	532,580
Structural shapes—Heavy	8,218,940
Steel piling—(Rolled)	434,600
Plates—Sheared	9,702,980
" —Universal	1,283,760
Hot rolled sheets—(Coils or cut lengths)	39,512,570
Coils for cold reduced black plate and tin plate	10,827,360
Hot rolled strip	2,686,110
Bars—Light shapes	1,273,680
" —Concrete reinforcement	2,919,630
" —All other	14,155,820
Wire rods	7,340,680
Skelp	6,070,920
Blanks, tube rounds or pierced billets for seamless tubes	5,830,180
Wheels and axles—(Rolled)	483,040
Blooms and billets for forging or export	731,300
All other—Hot rolled	300,100
TOTAL	113,785,590
TOTAL STEEL INGOT CAPACITY	148,570,970
PERCENT TO INGOT CAPACITY	76.6%
Companies:	
Acme Steel Company	600,000
Acme-Newport Steel Company	441,000
TOTAL	1,041,000
Alan Wood Steel Company	529,000
Alco Products, Inc.	25,000
Allegheny Ludlum Steel Corporation	768,480
American Chain & Cable Company, Inc.	68,500
American Compressed Steel Corporation	12,000
Ames & Company, Inc., W.	30,000
Armco Steel Corporation	
Armco Division	3,246,900
Sheffield Division	1,777,400
National Supply Company	500,000
TOTAL	5,524,300
Atlantic Steel Company	320,000
Babcock & Wilcox Company	204,000
Baldwin Lima-Hamilton Corporation	116,000
Bethlehem Steel Company	17,641,000
Borg-Warner Corporation	306,000
Braeburn Alloy Steel Corporation	3,200
Buffalo Steel Corporation	80,000
Byers Company, A. M.	*40,000
Carpenter Steel Company	67,400
Carpenter Steel of New England, Inc.	34,640
TOTAL	102,040
Ceco Steel Products Corporation	140,000
Colorado Fuel and Iron Corporation	1,882,500
Roebling's Sons Division, John A.	182,000
TOTAL	2,064,500
Columbia Tool Steel Company	1,800
Continental Steel Corporation	365,000
Copperweld Steel Company	604,350
Crucible Steel Company of America	1,032,100
Detroit Steel Corporation	800,000
Driver Company, Wilbur B.	5,000

Companies (Continued):	Annual Capacity Net Tons
Eastern Stainless Steel Corporation	36,000
Edgewater Steel Company	98,000
Firth Sterling, Inc.	16,600
Florida Steel Corporation	45,000
Ford Motor Company	1,498,000
Granite City Steel Company	1,175,000
Harco Corporation:	
Harrisburg Steel Company	125,000
Hawaiian Western Steel Limited	45,000
Inland Steel Company	5,058,500
International Harvester Company	799,000
Jersey Shore Steel Company	40,000
Jessop Steel Company	29,400
Green River Steel Corporation	108,000
TOTAL	137,400
Jones & Laughlin Steel Corporation	6,301,000
Joslyn Mfg. & Supply Company:	
Joslyn Stainless Steels Div.	28,000
Judson Steel Corporation	54,000
Kaiser Steel Corporation	2,312,700
Keystone Steel & Wire Company	480,000
Knoxville Iron Company	90,000
Laclede Steel Company	483,000
Latrobe Steel Company	6,500
Le Tourneau Inc., R. G.	85,500
Lockhart Iron and Steel Company	60,000
Lone Star Steel Company	705,000
Lukens Steel Company	790,000
McLouth Steel Corporation	1,734,000
Mahoning Valley Steel Company	52,000
Merritt-Chapman & Scott Corporation:	
Milton Steel Division	90,000
Mississippi Steel Corporation	45,000
Missouri Rolling Mill Corporation	39,000
National Steel Corporation:	
Great Lakes Steel Corporation	3,035,000
Weirton Steel Division	2,840,000
TOTAL	5,875,000
Northern Steel, Inc.	15,000
Northwest Steel Rolling Mills, Inc.	45,000
Northwestern Steel & Wire Company	867,000
Oklahoma Steel Corporation	15,000
Oregon Steel Mills	135,000
Pacific States Steel Corporation	144,000
Phoenix Manufacturing Company	198,000
Phoenix Steel Corporation	547,000
Pittsburgh Steel Company	1,289,000
Pollak Steel Company	105,000
Poor & Company, Inc.	12,000
Porter Company Inc., H. K.	251,000
Republic Steel Corporation	10,131,000
Roanoke Electric Steel Corporation	20,000
Seaway Steel Corporation	66,000
Sharon Steel Corporation	1,108,000
Simmons Company	36,000
Simonds Saw and Steel Company	12,200
Southern Electric Steel Company	60,000
Southwest Steel Rolling Mills	120,000
Structural Metals, Inc.	18,000
Sweet's Steel Company	109,000
Texas Steel Company	85,000
Timken Roller Bearing Company	455,500
Tredegar Company	38,500

Companies (Continued):	Annual Capacity Net Tons
United States Steel Corporation:	
American Steel and Wire Division	2,465,530
Columbia—Geneva Steel Division	2,308,000
National Tube Division	3,030,440
Tennessee Coal and Iron Division	2,863,500
United States Steel Corp. (Central Operations)	19,126,030
TOTAL	29,789,460
Universal-Cyclops Steel Corporation	49,100
Empire-Reeves Steel Corporation	480,000
TOTAL	529,100
Vanadium-Alloys Steel Company	34,000
Colonial Steel Company	32,330
TOTAL	66,330
Washburn Wire Company	73,000
Wesco Steel Rolling Mills Corporation	20,000
Wheeling Steel Corporation	2,000,000
Wickwire Brothers, Inc.	30,000
Youngstown Sheet and Tube Company	5,394,000
GRAND TOTAL	113,785,590

* Does not include hot rolled wrought iron products, annual capacity 330,000 tons.

By Plant Location and Operating Company

Plant Location and Operating Company:	Annual Capacity Net Tons
Alabama	
Bessemer	
Tennessee Coal & Iron Division	186,300
Birmingham:	
Porter Co., Inc., H. K.:	
Connors Steel Div.	136,000
Southern Electric Steel Corp.	60,000
Ensley	
Tennessee Coal & Iron Division	320,800
Fairfield	
Tennessee Coal & Iron Division	2,530,400
Gadsden	
Republic Steel Corporation	943,000
TOTAL	4,001,500

Names and Addresses of U. S. Companies

Acme Steel Co., 135th & Perry Ave.
Riverdale Station, Chicago 27, Ill.
Acme-Newport Steel Co.
Ninth & Lowell Sts., Newport, Ky.
Alan Wood Steel Co.
Conshohocken, Pa.
Alco Products Inc.
30 Church St., New York, N. Y.
Allegheny Ludlum Steel Corp.
2020 Oliver Bldg., Pittsburgh 22, Pa.
American Bridge Div.
United States Steel Corp.
525 William Penn Place
Pittsburgh 30, Pa.
American Chain & Cable Co. Inc.
230 Park Ave., New York 17, N. Y.
American Compressed Steel Corp.
900 E. Front St., Cincinnati 2, O.
American Metal Products Co.
5959 Linsdale Ave., Detroit 4, Mich.
American Shim Steel Co.
Second Ave. & Sixth St.
New Kensington, Pa.
American Steel & Wire Div.
United States Steel Corp.
Rockefeller Bldg., Cleveland 13, O.
Ames & Co. Inc., W.
417 Communipaw Ave.
Jersey City 4, N. J.

Anaconda Co.
25 Broadway, New York 4, N. Y.
Anchor Drawn Steel Co. Div.
Vanadium-Alloys Steel Co., Latrobe, Pa.
Angell Nail & Chaplet Co.
4580 E. 71st St., Cleveland 5, O.
AP Parts Corp.
AP Bldg., Toledo 1, Ohio
Armco Steel Corp.
703 Curtis St., Middletown, O.
Atlantic Steel Co.
P.O. Box 1714, Atlanta 1, Ga.
Atlantic Wire Co.
1 Church St., Branford, Conn.
Atlas Tack Corp., Fairhaven, Mass.
Avon Tube Div. Higbie Mfg. Co.
Fourth & Water Sts.
Rochester, Mich.

Babcock & Wilcox Co.
Tubular Products Div., Beaver Falls, Pa.
Baldwin-Lima-Hamilton Corp.
Standard Steel Works Div.
Burnham, Pa.
Barry Universal Corp.
10225 Lyndon Ave., Detroit 38, Mich.
Berger Machine Products Inc.
74-16 Grand Ave., Maspeth, N. Y.

Berkman Co., Louis, Steubenville, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Blair Strip Steel Co.
1209 Butler Ave., New Castle, Pa.
Bliss & Laughlin Inc., Harvey, Ill.
Borg-Warner Corp.
200 S. Michigan Ave., Chicago 4, Ill.
Braeburn Alloy Steel Corp.
Subsidiary of Continental Copper & Steel Industries Inc.
Braeburn, Pa.
Buffalo Steel Corp.
Fillmore Ave., Tonawanda, N. Y.
Bundy Tubing Co.
8109 E. Jefferson Ave., Detroit 14
Byers Co., A. M.
Clark Bldg., 717 Liberty Ave.
Pittsburgh 30, Pa.

Cabot Shops Inc.
P.O. Box 1101, Pampa, Tex.
California Steel & Tube
4000 Noakes St., Los Angeles 23
Cal-Metal Pipe Corp. of Louisiana
Mengel Road, P.O. Box 2548
Baton Rouge, La.
Calstrip Steel Corp.
7140 Bandini Blvd., Los Angeles 22

Calumet Steel Div.
Borg-Warner Corp., Chicago Heights, Ill.
Cameron Iron Works Inc.
P.O. Box 1212, Houston 1, Tex.
Carpenter Steel Co.
101 West Bern St., Reading, Pa.
Carpenter Steel Co. of New England Inc.
Subsidiary of Carpenter Steel Co.
Bridgeport, Conn.
Cavert Wire Co. Inc.
P.O. Box 808, Uniontown, Pa.
Ceco Steel Products Corp.
Subsidiary of Lemont Mfg. Corp.
Lemont, Ill.
Cedarburg Wire, Wire Nail & Screw Co.
Cedarburg, Wis.
Central Steel Tube Co., Clinton, Iowa
Chicago Steel & Wire Co.
103rd St. & Torrence Ave.
Chicago 17, Ill.
Chromium Mining & Smelting Corp.
13550 S. Indiana Ave.
Chicago 27, Ill.
Climax Molybdenum Co. Div.
American Metal Climax Inc.
1270 Avenue of the Americas
New York 20, N. Y.
(Please turn to page S-8)

Hot Rolled Steel Capacity by Plant Location and Operating Company (continued)

Companies (Continued)	Annual Capacity Net Tons
California	
Commerce	
Wesco Steel Rolling Mills Corporation	30,000
Emeryville	
Judson Steel Corporation	54,000
Fontana	
Kaiser Steel Corporation	2,212,700
Los Angeles	
Bethlehem Steel Company	356,000
Southwest Steel Rolling Mills	120,000
Pittsburg	
Columbia-Geneva Steel Division	221,250
San Francisco	
Simmons Company	13,000
South San Francisco	
Bethlehem Steel Company	235,000
Torrance	
Columbia-Geneva Steel Division	166,810
Union City	
Pacific States Steel Corp.	144,000
TOTAL	3,531,760
Colorado	
Pueblo	
Colorado Fuel & Iron Corp.	1,348,500
Connecticut	
Bridgeport	
Carpenter Steel of New England Inc.	34,640
Delaware	
Claymont	
Colorado Fuel & Iron Corp.	300,000
Florida	
Tampa	
Florida Steel Corporation	45,000
Georgia	
Atlanta	
Atlantic Steel Company	320,000
Hawaii	
Honolulu	
Hawaiian Western Steel, Ltd.	45,000
Illinois	
Alton	
Laclede Steel Company	324,500
Chicago	
Acme Steel Company	600,000
Borg-Warner Corp.:	
Ingersoll Products Div.	80,000
International Harvester Co.	799,000
Republic Steel Corporation	1,315,000
United States Steel Corp. (Central Operations)	2,331,340
Chicago Heights	
Borg-Warner Corp.:	
Calumet Steel Div.	121,000
Columbia Tool Steel Co.	1,800
Inland Steel Company	90,000
Granite City	
Granite City Steel Co.	1,175,000
Joliet	
American Steel & Wire Division	856,330
Phoenix Manufacturing Co.	196,000
Lemont	
Ceco Steel Products Corp.	140,000
Madison	
Laclede Steel Company	158,500
Peoria	
Keystone Steel & Wire Co.	480,000
Sterling	
Northwestern Steel & Wire Co.	867,000
TOTAL	9,435,460
Indiana	
East Chicago	
Inland Steel Company	4,968,500
Youngstown Sheet and Tube Co.	2,739,000
Fort Wayne	
Joslyn Stainless Steels Div.	28,000
Gary	
United States Steel Corp. (Central Operations)	6,635,460
Kokomo	
Continental Steel Corp.	365,000
New Castle	
Borg-Warner Corp.:	
Ingersoll Steel Div.	35,000
TOTAL	14,770,960
Kentucky	
Ashland	
Armco Steel Corporation	940,000
Newport	
Acme-Newport Steel Co.	441,000
Owensboro	
Green River Steel Corp.	108,000
TOTAL	1,498,000
Maryland	
Baltimore	
Armco Steel Corporation	55,200
Eastern Stainless Steel Corp.	36,000
Sparrows Point	
Bethlehem Steel Company	7,064,000
TOTAL	7,155,200
Massachusetts	
Medford	
Northern Steel, Inc.	15,000
Worcester	
American Steel & Wire Division	215,630
TOTAL	230,630
Michigan	
Dearborn	
Ford Motor Company	1,498,000
Ecorse	
Great Lakes Steel Corp.	3,035,000
Trenton	
McLouth Steel Corporation	1,734,000
Warren	
Jones & Loughlin Steel Corp.	162,800
TOTAL	6,429,800
Minnesota	
Duluth	
American Steel & Wire Division	151,650
Mississippi	
Jackson	
Mississippi Steel Corporation	45,000

Companies (Continued)	Annual Capacity Net Tons
Missouri	
Kansas City	
Armco Steel Corporation:	
Sheffield Division	687,000
St. Louis	
Missouri Rolling Mill Corp.	39,000
TOTAL	726,000
New Jersey	
Jersey City	
Ames & Company, Inc., W.	30,000
Newark	
Driver Company, Wilbur B.	5,000
Roebling	
Roebling's Sons Div., J. A.:	
Colorado Fuel & Iron Corp.	182,000
TOTAL	217,000
New York	
Buffalo	
Republic Steel Corporation	691,000
Cortland	
Wickwire Brothers, Inc.	30,000
Dunkirk	
Allegheny Ludlum Steel Corp.	45,360
Lackawanna	
Bethlehem Steel Company	4,641,000
Lockport	
Simonds Saw & Steel Co.	13,200
North Tonawanda	
Seaway Steel Corp.	66,000
Syracuse	
Crucible Steel Company of America	54,200
Tonawanda	
Colorado Fuel & Iron Corp.	234,000
Buffalo Steel Corp.	80,000
Troy	
Poor & Co., Inc.	12,000
Watervliet	
Allegheny Ludlum Steel Corp.	60,180
TOTAL	5,925,880
Ohio	
Campbell	
Youngstown Sheet and Tube Co.	1,905,000
Canton	
Republic Steel Corporation	1,300,000
Timken Roller Bearing Co.	448,000
Cincinnati	
American Compressed Steel Corp.	12,000
Cleveland	
American Steel & Wire Division	733,000
Jones & Loughlin Steel Corp.	1,575,500
Republic Steel Corporation	3,070,000
Elyria	
Republic Steel Corporation	37,000
Gambrinus	
Timken Roller Bearing Co.	7,500
Lorain	
National Tube Division	1,561,670
Lowellville	
Sharon Steel Corporation	62,000
Mansfield	
Empire-Reeves Steel Corporation	480,000
Marion	
Pollak Steel Company	105,000
Massillon	
Republic Steel Corporation	(a)
Middletown	
Armco Steel Corporation	1,800,000
Niles	
Mahoning Valley Steel Co.	52,000
Portsmouth	
Detroit Steel Corporation	800,000
Strebenville	
Wheeling Steel Corporation	1,508,000
Warren	
Copperweld Steel Company	464,350
Republic Steel Corporation	1,498,000
Youngstown	
Republic Steel Corporation	1,408,000
United States Steel Corp. (Central Operations)	1,982,530
Youngstown Sheet and Tube Co.	660,000
Zanesville	
Armco Steel Corporation	102,000
TOTAL	21,550,540
Oklahoma	
Oklahoma City	
Oklahoma Steel Corporation	15,000
Sand Springs	
Armco Steel Corporation:	
Sheffield Division	119,000
TOTAL	134,000
Oregon	
Portland	
Oregon Steel Mills	125,000
Pennsylvania	
Aliquippa	
Jones & Loughlin Steel Corp.	2,634,300
Porter Co., Inc., H. K.:	
Vulcan-Kidd Steel Div.	3,000
Allenport	
Pittsburgh Steel Company	1,059,000
Ambridge	
Armco Steel Corporation:	
National Supply Company	508,000
Byers Company, A. M.	40,000
Avis	
Jersey Shore Steel Co.	40,000
Beaver Falls	
Babcock & Wilcox Company	204,000
Bethlehem	
Bethlehem Steel Company	2,984,000
Brackenridge	
Allegheny Ludlum Steel Corp.	563,000
Braddock	
United States Steel Corp. (Central Operations)	43,860
Braeburn	
Braeburn Alloy Steel Corp.	3,300
Bridgeville	
Universal-Cyclops Steel Corp.	36,300
Burnham	
Baldwin-Lima-Hamilton Corp.:	
Standard Steel Works Div.	116,000
Butler	
Armco Steel Corporation	340,700
Carnegie	
Copperweld Steel Company:	
Superior Steel Div.	145,000
Clairton	
United States Steel Corp. (Central Operations)	539,330
Coatesville	
Lukens Steel Company	790,000

Companies (Continued)	Annual Capacity Net Tons
Donora	
American Steel & Wire Division	508,940
Dravosburg	
United States Steel Corp. (Central Operations)	2,551,680
Duquesne	
United States Steel Corp. (Central Operations)	629,980
Ellwood	
National Tube Division	303,300
Fairless Hills	
National Tube Division	449,890
United States Steel Corp. (Central Operations)	1,671,600
Farrell	
Sharon Steel Corporation	1,046,000
Franklin	
Borg-Warner Corp.:	
Franklin Steel Div.	70,000
Glassport	
Copperweld Steel Company	55,000
Harrisburg	
Harsco Corporation:	
Harrisburg Steel Co. Div.	125,000
Phoenix Steel Corp.	380,000
Ivy Rock	
Alan Wood Steel Company	539,000
Johnstown	
Bethlehem Steel Company	1,654,000
Latrobe	
Aico Products, Inc.	26,000
Latrobe Steel Company	6,500
Vanadium-Alloys Steel Co.	36,000
Lebanon	
Bethlehem Steel Company	196,000
McKeesport	
Firth Sterling, Inc.	16,600
National Tube Division	811,580
McKees Rocks	
Lockhart Iron & Steel Co.	60,000
Midland	
Crucible Steel Company of America	887,900
Milton	
Merritt-Chapman & Scott Corp.:	
Milton Steel Div.	90,000
Monaca	
Vanadium-Alloys Steel Co.:	
Colonial Steel Company	32,330
Monessen	
American Chain & Cable Co.:	
Page Steel & Wire Div.	68,500
Pittsburgh Steel Company	230,000
Munhall	
United States Steel Corp. (Central Operations)	2,781,360
Oakmont	
Edgewater Steel Company	98,000
Phoenixville	
Phoenix Steel Corp.	250,000
Pittsburgh	
Crucible Steel Company of America	90,000
Jones & Loughlin Steel Corp.	1,938,400
Reading	
Carpenter Steel Company	67,400
Bretton	
Bethlehem Steel Company	402,000
Tituaville	
Universal-Cyclops Steel Corp.	12,800
Washington	
Jessop Steel Company	29,400
West Leechburg	
Allegheny Ludlum Steel Corp.	100,000
Williamsport	
Sweet's Steel Company	104,000
TOTAL	28,044,740
Rhode Island	
Phillipsdale	
Washburn Wire Company	75,000
Tennessee	
Knoxville	
Knoxville Iron Company	90,000
Texas	
Fort Worth	
Texas Steel Company	85,000
Houston	
Armco Steel Corporation, Sheffield Division	971,400
Lone Star	
Lone Star Steel Co.	705,000
Longview	
LeTourneau, Inc., R. G.	85,500
Seguin	
Structural Metals, Inc.	18,000
TOTAL	1,864,900
Utah	
Geneva	
Columbia-Geneva Steel Division	1,919,940
Virginia	
Richmond	
Tredegar Company	38,500
Roanoke	
Roanoke Electric Steel Corp.	20,000
TOTAL	58,500
Washington	
Seattle	
Bethlehem Steel Company	199,000
Northwest Steel Rolling Mills, Inc.	45,000
TOTAL	244,000
West Virginia	
Benwood	
Wheeling Steel Corporation	492,000
Huntington	
Porter Co., Inc., H. K.:	
Conners Steel Div.	112,000
Weirton	
Weirton Steel Division	2,840,000
TOTAL	3,444,000
Wisconsin	
Kenosha	
Simmons Company	24,000
GRAND TOTAL	113,785,590

(a) Included in Canton, Ohio.

Structural Shapes, Steel Piling (Rolled) and Plates

	ANNUAL CAPACITY (N. T.)			
	Structural Shapes (Heavy)	Steel Piling (Rolled)	Plates Sheared	Plates Universal
Companies:				
Acme Steel Company:	....	....	24,000	....
Acme-Newport Strel Company	....	....	....	81,000
TOTAL	....	....	24,000	81,000
Alan Wood Steel Company	....	....	189,000	....
Armco Steel Corporation:				
Armco Division	....	....	240,000	....
Sheffield Division	133,300	....	636,900	....
TOTAL	133,300	....	876,900	....
Atlantic Steel Company	28,000	....	....	....
Bethlehem Steel Company	3,164,000	300,000	1,236,000	372,000
Borg-Warner Corporation	....	....	10,000	....
Byers Company, A. M.	....	....	*9,000	*8,000
Colorado Fuel and Iron Corporation	60,000	....	307,000	....
Crucible Steel Company of America	....	....	....	26,600
Eastern Stainless Steel Corporation	....	....	(a)	....
Granite City Steel Co.	....	....	185,000	....
Inland Steel Company	718,000	3,500	652,000	74,000
International Harvester Company	45,000	....	....	57,000
Jessop Steel Company	....	....	15,000	....
Jones & Laughlin Steel Corporation	233,600	....	223,200	7,200
Kaiser Steel Corporation	117,000	....	511,200	16,100
Le Tourneau Company, Inc., R. G.	....	....	85,500	....
Lone Star Steel Company	....	....	50,000	....
Lukens Steel Company	....	....	790,000	....
National Steel Corporation:				
Weirton Steel Division	200,000	....	....	....
Northwestern Steel & Wire Company	264,000	....	(a)	(a)
Oregon Steel Mills	16,500	....	....	....
Pacific States Steel Corporation	32,000	....	....	....
Phoenix Steel Corporation	259,000	....	182,400	105,600
Porter Company, Inc., H. K.	7,000	....	....	....
Republic Steel Corporation	....	....	138,000	....
Sharon Steel Corporation	....	....	....	156,000
Simonds Saw and Steel Company		....	400	....
United States Steel Corporation:				
Columbia-Geneva Steel Division	155,540	....	657,220	....
Tennessee Coal and Iron Division	215,900	....	447,600	23,200
United States Steel Corp. (Central Operations)	2,558,100	131,100	2,998,560	357,060
TOTAL	2,929,540	131,100	4,103,380	380,260
Universal-Cyclops Steel Corporation	....	....	....	(b)
Wheeling Steel Corporation	....	....	25,000	....
Youngstown Sheet and Tube Company	12,000	....	90,000	....
GRAND TOTAL	8,218,940	434,600	9,702,980	1,283,760

* Does not include wrought iron plates, annual capacity 21,000 tons sheared and 62,000 tons universal mill.
(a) Included in hot rolled sheets.

(a) Included with structural shapes.
(b) Included with hot rolled sheets.

Hot Rolled Sheets

	Annual capacity (N. T.)
Companies:	
Acme Steel Company	150,000
Acme-Newport Steel Company	360,000
TOTAL	510,000
Alan Wood Steel Company	(a)
Allegheny Ludlum Steel Corporation	563,000
Armco Steel Corporation	2,904,900
Bethlehem Steel Company	5,360,000
Borg-Warner Corporation	105,000
Byers Company, A. M.	*15,000
Continental Steel Corporation	57,000
Crucible Steel Company of America	(b)1,59,100
Detroit Steel Corporation	600,000
Eastern Stainless Steel Corporation	(c) 36,000
Ford Motor Company	1,414,000
Granite City Steel Company	906,000
Inland Steel Company	2,562,000
International Harvester Company	7,000
Jessop Steel Company	7,700
Jones & Laughlin Steel Corporation	3,295,800
Kaiser Steel Corporation	420,000
McLouth Steel Corporation	(d)1,734,000
Mahoning Valley Steel Company	52,000
National Steel Corporation:	
Great Lakes Steel Corporation	2,705,000
Weirton Steel Division	(e)
TOTAL	2,705,000
Pittsburgh Steel Company	753,000
Republic Steel Corporation	3,957,000
Sharon Steel Corporation	412,000
Simonds Saw and Steel Company	5,000
United States Steel Corporation:	
Columbia-Geneva Steel Division	650,050
Tennessee Coal and Iron Division	730,700
United States Steel Corp. (Central Operations)	6,296,820
TOTAL	7,677,570
Universal-Cyclops Steel Corporation	13,100
Empire-Reeves Steel Corp.	(f)480,000
TOTAL	493,100
Vanadium-Alloys Steel Company:	
Colonial Steel Company	2,400
Wheeling Steel Corporation	250,000
Youngstown Sheet and Tube Company	2,250,000
GRAND TOTAL	39,512,570

(a) Included with hot rolled strip.
(b) Includes coils.
(c) Includes plates.
(d) Includes hot rolled strip.
(e) Included with coils for cold reduced black plate and tin plate.
(f) Includes hot rolled strip and plates—universal.
* Does not include wrought iron sheets and strip, annual capacity 45,000 tons.

Coils for Cold-Reduced Black Plate and Tin Plate

	Annual capacity (N. T.)
Companies:	
Bethlehem Steel Company	1,675,000
Granite City Steel Company	84,000
Inland Steel Company	321,000
Jones & Laughlin Steel Corporation	649,900
Kaiser Steel Corporation	483,700
National Steel Corporation:	
Weirton Steel Division	(b)2,640,000
Republic Steel Corporation	316,000
United States Steel Corporation:	
Columbia-Geneva Steel Division	503,200
Tennessee Coal and Iron Division	650,500
United States Steel Corp. (Central Operations)	1,758,060
TOTAL	2,919,760
Wheeling Steel Corporation	1,333,000
Youngstown Sheet and Tube Company	612,000
GRAND TOTAL	10,847,360

(b) Includes capacity of hot rolled sheets.

Rails, Long Joint or Splice Bars and Tie Plate Bars and Wheels and Axles (Rolled)

	ANNUAL CAPACITY (N. T.)			
	Rails		Long joint or splice bars and tie plate bars	Wheels and Axles (Rolled)
	Standard (over 60 lbs. per yard)	60 lbs. or less per yard		
Companies:				
Armco Steel Corporation	....	....	....	46,800
Baldwin-Lima-Hamilton Corporation	....	....	....	66,000
Bethlehem Steel Company	312,000	6,000	131,000	152,000
Colorado Fuel and Iron Corporation	350,000	8,000	120,000	....
Edgewater Steel Company	....	....	....	62,000
Poor & Company	....	....	12,000	....
Porter Company, Inc., H. K.	....	10,000	....	....
Sweet's Steel Company	....	57,000	(a)	....
Tredegar Company	....	....	20,000	....
United States Steel Corporation:				
Columbia-Geneva Steel Division	....	....	14,300	....
Tennessee Coal and Iron Division	223,600	3,200	80,000	....
United States Steel Corp. (Central Operations)	510,000	25,740	155,280	156,240
TOTAL	733,600	28,940	249,580	156,240
GRAND TOTAL	1,395,600	109,940	532,580	483,040

(a) Included in capacity of hot rolled bars.

Blooms and Billets

	Annual capacity (N. T.)
Companies:	
Allegheny Ludlum Steel Corporation	8,600
Bethlehem Steel Company	372,000
Colorado Fuel and Iron Corporation	1,000
Harsco Corporation:	
Harrisburg Steel Company	125,000
Inland Steel Company	12,000
International Harvester Company	72,000
Jessop Steel Company:	
Green River Steel Corporation	84,000
Joslyn Stainless Steels Division	6,000
Kaiser Steel Corporation	9,700
Oregon Steel Mills	15,000
Sharon Steel Corporation	26,000
GRAND TOTAL	731,300

Skelp

	Annual capacity (N. T.)
Companies:	
Bethlehem Steel Company	730,000
Byers Company, A. M.	(a) 3,000
Jones & Laughlin Steel Corporation	127,300
Kaiser Steel Corporation	537,500
Laclede Steel Company	77,000
Lone Star Steel Company	(b) 655,000
Republic Steel Corporation	1,293,000
United States Steel Corporation:	
National Tube Division	794,640
United States Steel Corp. (Central Operations)	377,580
TOTAL	1,172,220
Wheeling Steel Corporation	492,000
Youngstown Sheet and Tube Company	984,000
GRAND TOTAL	6,070,920

(a) Does not include wrought iron skelp, annual capacity 137,000 tons.
(b) Includes hot rolled strip.

Sheets (Cold Rolled, Galvanized and Long Terne)

	ANNUAL CAPACITY (N. T.)		
	Cold rolled sheets	Galvanized sheets	Long terne sheets
Companies:			
Acme Steel Company:			
Acme-Newport Steel Company	100,000	....	....
Alan Wood Steel Company	240,000	....	....
Allegheny Ludlum Steel Corporation	294,800	....	....
Armco Steel Corporation	1,998,600	648,500	52,800
Bethlehem Steel Company	2,904,000	336,000	....
Continental Steel Corporation	....	100,000	....
Crucible Steel Company of America	39,800	....	....
Detroit Steel Corporation	420,000	....	....
Eastern Stainless Steel Corporation	50,000	....	....
Ford Motor Company	885,000	....	....
Granite City Steel Company	312,000	225,400	....
Inland Steel Company	1,605,000	358,000	....
Jones & Laughlin Steel Corporation	1,468,600	138,000	....
Kaiser Steel Corporation	(a)	....	....
McLouth Steel Corporation	643,680	....	....
National Steel Corporation:			
Great Lakes Steel Corporation	2,220,000	....	....
Weirton Steel Division	750,000	535,000	20,000
TOTAL	2,970,000	535,000	20,000
Pittsburgh Steel Company	410,000	....	....
Republic Steel Corporation	2,576,000	560,000	24,000
United States Steel Corporation:			
Columbia-Geneva Steel Division	365,860	150,870	....
Tennessee Coal and Iron Division	389,700	281,700	....
United States Steel Corp. (Central Operation)	2,202,630	376,400	56,300
TOTAL	2,958,190	808,970	56,300
Universal-Cyclops Steel Corporation	(a)	120,000	15,000
Washington Steel Corporation	40,000	....	....
Wheeling Steel Corporation	700,000	324,000	38,000
Youngstown Sheet and Tube Company	1,392,000	....	....
GRAND TOTAL	22,007,670	4,153,870	206,100

(a) Included with cold rolled strip.

Hot Dipped Tin and Terne Plate and Electrolytic Tin Plate

	ANNUAL CAPACITY (N. T.)		
	Hot dipped tin and terne plate	Electrolytic tin plate	Total
Companies:			
Bethlehem Steel Company	120,000	1,140,000	1,260,000
Granite City Steel Company	....	227,000	227,000
Inland Steel Company	....	277,000	277,000
Jones & Laughlin Steel Corporation	112,000	412,000	524,000
Kaiser Steel Corporation	70,000	371,000	441,000
National Steel Corporation:			
Weirton Steel Company	165,000	1,280,000	1,445,000
Republic Steel Corporation	....	180,000	180,000
United States Steel Corporation:			
Columbia-Geneva Steel Division	92,960	529,600	622,560
Tennessee Coal and Iron Division	102,400	462,900	565,300
United States Steel Corp. (Central Operations)	428,500	1,416,630	1,845,130
TOTAL	623,860	2,409,130	3,032,990
Wheeling Steel Corporation	31,200	275,000	306,200
Youngstown Sheet and Tube Company	60,000	456,000	516,000
GRAND TOTAL	1,182,060	7,027,130	8,209,190

Splice Bars, Other Rail Joints, Tie Plates, and Track Spikes

	ANNUAL CAPACITY (N. T.)		
	Splice Bars and Other Rail Joints	Tie Plates	Track Spikes
Companies:			
Ames & Company, Inc., W.	....	....	18,000
Armco Steel Corporation:			
Sheffield Division	....	....	24,000
Bethlehem Steel Company	26,400	96,600	28,000
Colorado Fuel & Iron Corporation	50,000	150,000	20,000
Inland Steel Company	....	....	24,000
Jones & Laughlin Steel Corporation	....	....	36,000
Republic Steel Corporation	....	....	35,000
Tredegar Company	....	....	6,000
United States Steel Corporation:			
American Steel and Wire Division	150,000	....	....
Columbia-Geneva Steel Division	....	45,070	....
Tennessee Coal and Iron Division	62,900	150,200	30,000
United States Steel Corp. (Central Operations)	51,500	148,500	....
TOTAL	264,400	343,770	30,000
Youngstown Sheet and Tube Company	....	....	28,800
GRAND TOTAL	340,800	590,370	249,800

Strip (Cold Rolled and Galvanized)

	ANNUAL CAPACITY (N. T.)	
	Cold rolled strip	Galvanized strip
Companies:		
Acme Steel Company	256,700	106,840
Alan Wood Steel Company	(a)	....
Allegheny Ludlum Steel Corporation	193,440	....
Wallingford Steel Company	35,000	....
TOTAL	228,440	....
American Shim Steel Company	36,000	....
Atlantic Steel Company	....	13,000
Barry Universal Corp.	24,000	....
Blair Strip Steel Company	52,000	....
Calstrip Steel Corporation	36,000	....
Carpenter Steel Company	10,090	....
Colorado Fuel and Iron Corporation:		
Roebling's Sons Div., John A.	34,500	9,500
Copperweld Steel Company	80,000	....
Crucible Steel Company of America	92,300	....
Detroit Steel Corporation	175,000	....
Driver Company, Wilbur B.	1,100	....
Firth Sterling, Inc.	500	....
Greer Steel Company	87,000	12,000
Griffin Manufacturing Company	27,000	....
Hind Steel Company, Inc.	5,000	....
Hofmann Industries Inc.	24,000	....
Inland Steel Company	(a)	....
Jones & Laughlin Steel Corporation	94,600	10,000
Kaiser Steel Corporation	36,000	....
McLouth Steel Corporation	117,020	....
Mill Strip Products Company	188,000	....
National-Standard Company	12,000	....
National Steel Corporation:		
Weirton Steel Division	60,000	....
Newman-Crosby Steel Corporation	29,000	....
Pittsburgh Steel Company	120,000	12,000
Porter Company, Inc., H. K.	2,900	....
Republic Steel Corporation	503,000	....
Rodney Metals, Inc.	20,000	....
Rome Strip Steel Company, Inc.	40,000	....
Sharon Steel Corporation	198,000	58,000
Simonds Saw & Steel Company	1,500	....
Stanley Works	105,000	....
Techalloy Company, Inc.	3,000	....
Thompson Wire Company	150,000	....
Ulbrich Stainless Steels, Inc.	8,000	....
United States Steel Corporation:		
American Steel and Wire Division	236,210	22,530
Universal-Cyclops Steel Corporation	336,500	....
Wallace Barnes Company	25,000	....
Washburn Wire Company	22,000	500
Washington Steel Corporation	(a)	....
Wheeling Steel Corp.	150,000	....
GRAND TOTAL	3,627,260	244,370

(a) Included with cold rolled sheets.

How Hot Rolled Product Capacities Have Changed

Hot rolled steel product capacities in the U. S. rose 10.4 per cent in three years. The total climbed from 103,022,230 net tons on Jan. 1, 1957, to 113,785,590 tons on Jan. 1, 1960, a net increase of 10,763,360 tons.

The Jan. 1, 1960, hot rolled steel product capacity is equivalent to 76.6 per cent of the nation's steel ingot capacity (148,570,970 net tons). On Jan. 1, 1957, the percentage was 77.2.

Changes in hot rolled steel product capacities in the last three years follow:

	Increases (Net tons)	Decreases (Net tons)
Rails—Standard, over 60 lb per yard	.....	202,900
Rails—60 lb or less per yard	3,240	.....
Long joint or splice bars and tie plate bars	.....	87,020
Structural shapes—Heavy	1,190,540	.....
Steel piling—Rolled	35,600	.....
Plates—Sheared	1,785,980	.....
Plates—Universal	.....	26,740
Hot rolled sheets	5,983,400	.....
Coils for cold reduced black plate and tin plate	1,542,060	.....
Hot rolled strip	.....	571,450
Bars—Light shapes	186,580	.....
Bars—Concrete reinforcement	392,080	.....
Bars—All other	128,300	.....
Wire rods	.....	34,370
Skelp	338,020	.....
Blanks, tube rounds or pierced billets for seamless tubes	412,980	.....
Wheels and axles—Rolled	.....	5,460
Blooms and billets for forging or export	.....	234,080
All other—Hot rolled	.....	73,400
Totals	11,998,780	1,235,420

Hot Rolled Strip

Companies:	Annual capacity (N. T.)
Acme Steel Company	396,000
Alan Wood Steel Company	340,000
Allegheny Ludlum Steel Corporation	150,000
Armco Steel Corporation	(a)
Atlantic Steel Company	66,000
Bethlehem Steel Company	(a)
Byers Company, A. M.	(a)
Carpenter Steel Company	12,570
Colorado Fuel and Iron Corporation	2,500
Rochling's Sons Division (John A.)	12,300
TOTAL	14,800
Copperweld Steel Company	145,000
Crucible Steel Company of America	(a)
Detroit Steel Corporation	(a)
Firth Sterling, Inc.	3,600
Inland Steel Company	28,000
International Harvester Company	22,000
Kaiser Steel Corporation	2,700
Knoxville Iron Company	1,500
Laclede Steel Company	67,000
Lone Star Steel Company	(b)
McLouth Steel Corporation	(a)
National Steel Corporation:	
Great Lakes Steel Corporation	(a)
Porter Company Inc., H. K.	1,500
Republic Steel Corporation	375,000
Sharon Steel Corporation	514,000
Simonds Saw and Steel Company	800
United States Steel Corporation:	
American Steel and Wire Division	86,100
Columbia-Geneva Steel Division	6,960
Tennessee Coal and Iron Division	64,006
United States Steel Corp. (Central Operations)	359,480
TOTAL	536,540
Universal-Cyclops Steel Corporation	(a)
Washburn Wire Company	32,000
Youngstown Sheet and Tube Company	12,000
GRAND TOTAL	2,656,110

(a) Included in capacity of hot rolled sheets.
(b) Included in capacity of skelp.

Blanks, Tube Rounds or Pierced Billets for Seamless Tubes

Companies:	Annual capacity (N. T.)
Armco Steel Corporation:	
National Supply Company	500,000
Babcock & Wilcox Company	204,000
Bethlehem Steel Company	12,000
Colorado Fuel and Iron Corporation	300,000
Copperweld Steel Company	50,000
Inland Steel Company	10,000
Jones & Laughlin Steel Corporation	563,400
Pittsburgh Steel Company	306,000
Republic Steel Corporation	336,000
Timken Roller Bearing Company	302,000
United States Steel Corporation:	
National Tube Division	2,231,800
United States Steel Corp. (Central Operations)	196,980
TOTAL	2,428,780
Youngstown Sheet and Tube Company	834,000
GRAND TOTAL	5,836,180

All Other Hot-Rolled Products

Companies:	Annual capacity (N. T.)
Alco Products, Inc.	26,000
Armco Steel Corporation:	
Sheffield Division	45,000
Baldwin-Lima-Hamilton Corporation	50,000
Borg-Warner Corporation	30,000
Colorado Fuel and Iron Corporation	75,000
Edgewater Steel Company	36,000
Firth Sterling, Inc.	6,000
Jones & Laughlin Steel Corporation	25,600
Porter Company, Inc., H. K.	2,000
Universal-Cyclops Steel Corporation	3,900
GRAND TOTAL	309,100

Pipe and Tubing

	ANNUAL CAPACITY (N. T.)					
	Buttweld	Lapweld	Seamless	Electric-weld	Spiral-weld	Gasweld
Companies:						
A P Parts Corporation	....	....	....	30,000	....	....
Acme-Newport Steel Co. (Acme Steel Company)	....	....	....	95,000	15,000	....
Allegheny Ludlum Steel Corporation	....	....	3,600	....	....	....
Wallingford Steel Company	....	....	....	....	....	2,300
TOTAL	....	....	3,600	....	....	2,300
American Metal Products Company	....	....	....	32,000	....	....
Armco Steel Corporation	....	....	....	27,000	144,000	....
National Supply Company	250,000	....	400,000	7,300	....	....
TOTAL	250,000	....	400,000	34,300	144,000	....
Avon Tube Division, Higbie Manufacturing Company	....	....	....	8,400	....	....
Babcock & Wilcox Company	....	....	276,000	60,000	....	....
Berger Machine Products, Inc.	....	....	....	20,000	....	....
Bethlehem Steel Company	360,000	....	....	264,000	....	....
Bundy Tubing Company	....	....	....	12,000	....	27,500
Byers Company, A. M.	47,000	90,000	....	....	....	....
Cal-Metal Pipe Corp. of La.	....	....	....	200,000	....	....
California Steel & Tube	....	....	....	6,000	....	....
Central Steel Tube Company	....	....	....	30,000	....	....
Colorado Fuel and Iron Corporation	....	....	240,000	150,000	....	....
Columbia Steel & Shafting Company	....	....	8,000	....	....	....
Copperweld Steel Company	....	....	48,000	8,400	....	....
Crucible Steel Co. of America	....	....	....	4,000	....	....
Damascus Tube Company	....	....	....	750	....	....
Electroweld Steel Corporation	....	....	....	7,200	....	....
Formed Tubes, Inc.	....	....	....	12,000	....	....
Fretz-Moon Tube Co., Inc.	70,000	....	....	....	....	....
Harris Tube, Inc.	....	....	....	20,000	....	....
Hofmann Industries, Inc.	....	....	....	15,000	....	....
Irvin Steel Tube Works, Inc.	....	....	2,000	....	....	....
James Steel & Tube Company	....	....	....	18,000	....	....
Jones & Laughlin Steel Corporation	420,000	....	480,000	266,000	....	....
Kaiser Steel Corporation	120,000	....	....	832,000	....	....
Kane Boiler Works, Inc.	....	....	....	24,000	....	....
Kilby Steel Company, Inc.	....	....	50,000	....	....	....
Kuehne Manufacturing Company	....	....	....	8,000	....	....
Laclede Steel Company	100,000	....	....	24,000	....	5,000
Lone Star Steel Company	....	....	....	520,000	....	....
Mahoning Valley Steel Company	....	....	....	24,000	....	....
Mark & Company, Clayton	....	....	....	32,000	....	....
Master Tank & Welding, Ltd.	....	....	....	100,000	....	....
Miami Industries, Inc.	....	....	....	35,000	....	....
Michigan Seamless Tube Co.	....	....	56,000	....	....	....
Monroe Auto Equipment Company	....	....	....	21,000	....	....
Motyka Metal Products Tubing Div., Inc.	....	....	....	4,000	....	....
Naylor Pipe Company	....	....	....	....	28,000	....
Nikoh Tube Company	....	....	....	100,000	....	....
Phoenix Steel Corporation	....	....	75,000	....	....	....
Pittsburgh Steel Company	....	....	250,000	....	....	....
Pittsburgh Tube Company	42,000	....	....	....	....	....
Republic Steel Corporation	410,000	....	276,000	889,000	....	....
Rome Manufacturing Company	....	....	....	18,000	....	....
Sawhill Tubular Products, Inc.	120,000	....	....	60,000	....	....
Service Steel Division	1,000	....	2,500	500	....	....
Sharon Tube Company	48,000	....	....	....	....	....
Shwayder Brothers, Inc.	....	....	....	10,000	....	....
Simmons Company	3,100	....	....	....	....	....
Smith Corporation, A. O.	....	....	....	564,000	....	....
Smith Corp. of Texas, A. O.	....	....	....	480,000	....	....
Southeastern Metals Co., Inc.	....	....	....	20,000	....	....
Southern Fabricating Company, Inc.	....	....	....	25,000	....	....
Southern Pipe Division	....	....	....	85,000	....	....
Standard Tube Company	....	....	....	114,000	....	....
State Industries	....	....	....	5,500	....	....
Superior Tube Company	....	....	2,200	450	....	....
Taylor Forge & Pipe Works	....	....	....	12,000	120,000	....
Tex-Tube, Inc.	....	....	....	60,000	....	....
Timken Roller Bearing Company	....	....	257,000	....	....	....
Toledo Steel Tube Company	....	....	....	25,000	....	....
Tubeco, Inc.	....	....	....	3,000	....	....
Tubecraft	....	....	....	18,000	....	....
Tube Reducing Corp. (American Metal Products Co.)	....	....	30,000	....	....	....
Union Steel Corporation	....	....	....	4,000	....	....
United States Steel Corporation:						
American Bridge Division	....	....	....	350,000	....	....
Consolidated Western Steel Division	....	....	....	533,100	....	....
National Tube Division	812,000	....	2,016,820	291,640	....	....
TOTAL	812,000	....	2,016,820	1,174,740	....	....
United Tube Corp. of Ohio	....	....	....	15,000	....	....
Van Huffel Tube Corporation	....	....	....	84,000	....	....
Welded Tubes, Inc.	....	....	....	4,800	....	....
Wheatland Tube Company	120,000	....	....	28,000	....	....
Wheeling Steel Corporation	350,000	....	....	....	....	....
Williams Manufacturing Company	....	....	....	2,000	....	....
Youngstown Sheet & Tube Co.	528,000	....	720,000	348,000	....	....
TOTAL	3,811,100	90,000	5,193,120	7,066,940	307,000	34,800

Changes in Product Capacities Between Jan. 1, 1957, and Jan. 1, 1960

(Other than hot rolled products)

	Increases (Net tons)	Decreases (Net tons)
Cold finished bars	165,820	.....
Pipe and tubing		
Buttweld	220,500	.....
Lapweld	.....	180,000
Seamless	315,390	.....
Electricweld	1,126,500	.....
Spiralweld	43,000	.....
Gasweld	1,000	.....
Wire and wire products		
Plain wire	21,160	.....
Galvanized wire	.....	157,850
Nails and staples	.....	107,520
Barbed wire	.....	187,800
Woven fence	.....	150,080
Reinforcing fabric and netting	537,340	.....
Bale ties	.....	14,810
Cold rolled sheets	2,705,090	.....
Galvanized sheets	397,630	.....
Long terne sheets	.....	60,400
Hot dipped tin and terne plate	.....	581,550
Electrolytic tin plate	1,503,870	.....
Cold rolled strip	678,380	.....
Galvanized strip	.....	179,660
Splice bars and other rail joints	.....	6,150
Tie plates	.....	35,930
Track spikes	Unchanged	

Hot Rolled Bars

	ANNUAL CAPACITY (N. T.)		
	Bars		
	Light Shapes	Concrete Reinforcement	All Other
Companies:			
Acme Steel Company	....	....	30,000
Allegheny Ludlum Steel Corporation	1,280	....	74,800
American Compressed Steel Corporation	....	12,000	....
Ames & Company, Inc., W.	....	....	30,000
Armco Steel Corporation:			
Armco Division	31,200	....	....
Sheffield Division	128,700	250,900	260,500
TOTAL	159,900	250,900	260,500
Atlantic Steel Company	40,000	60,000	50,000
Bethlehem Steel Company	187,000	672,000	1,908,000
Borg-Warner Corporation	70,000	42,000	49,000
Braeburn Alloy Steel Corporation	....	....	3,200
Buffalo Steel Corporation	....	25,000	55,000
Byers Company, A. M.	....	....	*5,000
Carpenter Steel Company	....	....	72,370
Ceco Steel Products Corporation	....	98,000	42,000
Colorado Fuel and Iron Corporation	20,000	70,000	60,000
Columbia Tool Steel Company	....	....	1,800
Continental Steel Corporation	....	8,000	....
Copperweld Steel Company	....	1,000	353,350
Crucible Steel Company of America	....	....	833,400
Firth Sterling, Inc.	....	....	5,000
Florida Steel Corporation	5,000	40,000	....
Ford Motor Company	....	....	84,000
Hawaiian Western Steel Limited	....	....	45,000
Inland Steel Company	145,000	75,000	458,000
International Harvester Company	33,000	....	563,000
Jersey Shore Steel Company	....	(a)	40,000
Jessop Steel Company	....	....	6,700
Green River Steel Corporation	....	....	24,000
TOTAL	....	....	30,700
Jones & Laughlin Steel Corporation	65,200	48,000	599,900
Joslyn Stainless Steels Div.	....	....	18,000
Judson Steel Corporation	....	40,000	14,000
Kaiser Steel Corporation	....	50,000	55,800
Knoxville Iron Company	13,900	23,100	51,500
Laclede Steel Company	31,500	129,500	33,000
Latrobe Steel Company	....	....	6,500
Lockhart Iron and Steel Company	....	....	60,000
Merritt-Chapman & Scott Corporation	....	90,000	....
Mississippi Steel Corporation	15,000	30,000	....
Missouri Rolling Mill Corporation	24,000	15,000	....
National Steel Corporation:			
Great Lakes Steel Corporation	240,000	....	....
Northern Steel, Inc.	....	15,000	....
Northwest Steel Rolling Mills, Inc.	....	31,500	13,500
Northwestern Steel & Wire Company	....	....	(c) 288,000
Oklahoma Steel Corporation	....	(b) 15,000	....
Oregon Steel Mills	5,500	75,000	13,000
Pacific States Steel Corporation	16,000	70,000	26,000
Phoenix Manufacturing Company	....	38,000	158,000
Pollak Steel Company	25,000	60,000	20,000
Porter Company, Inc., H. K.	139,400	60,000	31,000
Republic Steel Corporation	....	....	(e)3,495,000
Roanoke Electric Steel Corporation	....	....	20,000
Seaway Steel Corporation	....	....	30,000
Simmons Company	(a)	3,000	33,000
Simonds Saw and Steel Company	....	....	6,000
Southern Electric Steel Company	15,000	30,000	15,000
Southwest Steel Rolling Mills	....	(b) 130,000	....
Structural Metals, Inc.	....	....	18,000
Sweet's Steel Company	....	....	(c) 47,000
Texas Steel Company	....	70,000	15,000
Timken Roller Bearing Company	....	....	153,500
Tredegar Company	....	3,500	15,000
United States Steel Corporation:			
American Steel and Wire Division	....	....	38,810
Columbia-Geneva Steel Division	(a)	99,570	73,700
Tennessee Coal and Iron Division	....	130,900	162,800
United States Steel Corp. (Central Operations)	(a)	300,660	2,934,360
TOTAL	(a)	531,130	3,309,670
Universal-Cyclops Steel Corporation	....	....	20,400
Vanadium-Alloys Steel Company	....	....	34,000
Colonial Steel Company	....	....	29,930
TOTAL	....	....	63,930
Wesco Steel Rolling Mills Corporation	4,000	12,000	4,000
Youngstown Sheet and Tube Company	18,000	6,000	468,000
GRAND TOTAL	1,373,680	2,919,630	14,155,820

* Does not include wrought iron bars, annual capacity 45,000 tons.

(a) Included in capacity of bars—all other.
(b) Includes light shapes.
(c) Includes concrete reinforcement.
(e) Includes concrete reinforcement bars and tube rounds.

(a) Included in capacity of bars—all other.
(b) Includes light shapes.
(c) Includes splice bars, tie plates and rerolled concrete reinforcement bars.

Cold Finished Bars

	Annual capacity (N. T.)
Companies:	
Allegheny Ludlum Steel Corporation	28,500
Armco Steel Corporation	21,600
Atlantic Wire Company	1,200
Bethlehem Steel Company	75,000
Blue & Laughlin, Inc.	547,000
Carpenter Steel Company	53,300
Columbia Steel & Shafting Company	135,000
Compressed Steel Shafting Company	20,000
Copperweld Steel Company	55,180
Crucible Steel Company of America	160,400
Cumberland Steel Company	50,000
Cuyahoga Steel & Wire Company	25,000
Eaton Manufacturing Company (Reliance Division)	27,000
Firth Sterling, Inc.	2,800
Fitzsimons Steel Company	50,000
Fort Howard Steel & Wire, Division (Research Facts & Engr. Corp.)	21,600
Harper Company, H. M.	7,800
International Harvester Company	58,240
Jones & Laughlin Steel Corporation	500,300
Joslyn Manufacturing & Supply Company	25,000
Keystone Drawn Steel Company	40,000
La Belle Steel Company	310,000
Latrobe Steel Company	1,500
Moltrup Steel Products Company	72,000
Nelsen Steel & Wire Company	150,000
Pacific Tube Company	40,000
Page in Drawn Steel Division (Automotive Mat'ls Corp.)	150,000
Plymouth Steel Corporation	50,000
Porter Co., Inc., H. K. (Vulcan-Kidd Steel Div.)	1,000
Precision Drawn Steel Company	77,000
Republic Steel Corporation	510,000
Superior Drawn Steel Company	26,000
Timken Roller Bearing Company	125,000
United States Steel Corporation:	
American Steel and Wire Company	84,510
United States Steel Corp. (Central Operations)	10,900
TOTAL	95,410
Universal-Cyclops Steel Company	7,350
Vanadium-Alloys Steel Company:	
Anchor Drawn Steel Company	3,000
Pittsburgh Tool Steel Wire Company	7,400
TOTAL	10,400
Western Automatic Machine Screw Company	53,500
Wyckoff Steel Company	483,700
Youngstown Sheet and Tube Company	90,000
TOTAL	4,175,600

Wire Rods

	Annual capacity (N. T.)
Companies:	
Allegheny Ludlum Steel Corporation	20,800
American Chain & Cable Company, Inc.	68,500
Armco Steel Corporation:	
Armco Division	24,000
Sheffield Division	321,500
TOTAL	345,500
Atlantic Steel Company	76,000
Bethlehem Steel Company	852,000
Carpenter Steel Company	17,100
Colorado Fuel and Iron Corporation	509,000
Roebling's Sons Division (John A.)	169,700
TOTAL	678,700
Continental Steel Corporation	300,000
Copperweld Steel Company	55,000
Crucible Steel Company of America	13,000
Detroit Steel Corporation	200,000
Driver Company, Wilbur B.	5,000
Firth Sterling, Inc.	1,000
Jones & Laughlin Steel Corporation	362,000
Joslyn Stainless Steels Division	4,000
Keystone Steel & Wire Company	480,000
Laclede Steel Company	150,000
Northwestern Steel & Wire Company	315,000
Pittsburgh Steel Company	230,000
Republic Steel Corporation	319,000
Seaway Steel Corporation	36,000
United States Steel Corporation:	
American Steel and Wire Division	2,340,630
Columbia-Geneva Steel Division	148,460
Tennessee Coal and Iron Division	131,100
TOTAL	2,620,190
Universal-Cyclops Steel Corporation	11,700
Washburn Wire Company	41,000
Wickwire Brothers, Inc.	30,000
Youngstown Sheet and Tube Company	108,000
GRAND TOTAL	7,340,480

Trends in Bar Capacities

(Net tons)

	Hot Rolled	Cold Finished
1960	14,155,820	4,175,600
1957	14,027,520	4,009,780
1954	14,176,150	3,761,730
1951	11,977,810	2,968,395
1948	12,150,560	3,217,260

Wire and Wire Products

	ANNUAL CAPACITY (N. T.)						
	Plain wire	Galvanized wire	Nails and staples	Barbed wire	Woven fence	Reinforcing fabric and netting	Bale ties
Companies:							
American Chain & Cable Co., Inc.	92,000	18,000	....	600	....	....	....
Angell Nail & Chaplet Co.	22,000	....	18,000	....	....	....	....
Armco Steel Corporation	14,400	....	....	....	....	....	....
Sheffield Division	275,000	59,000	61,200	28,900	36,000	73,000	3,800
Union Wire Rope Corp.	66,000	6,000	....	....	....	....	....
TOTAL	355,400	65,000	61,200	28,900	36,000	73,000	3,800
Atlantic Steel Company	87,600	31,000	43,000	13,000	11,350	....	6,000
Atlantic Wire Company	24,000	1,800	....	....	....	7,000	....
Atlas Tack Corporation	5,000	....	4,900*	....	....	....	....
Bethlehem Steel Company	626,000	162,000	68,000	2,400	....	....	12,000
Cavert Wire Company, Inc.	3,600	....	....	....	....	....	2,500
Carpenter Steel Company	840	....	....	....	....	....	....
Cedarburg Wire, Nail & Screw Co.	1,200	....	1,200	....	....	....	....
Chicago Steel & Wire Co.	15,000	12,000	....	....	....	....	....
Colorado Fuel and Iron Corp.	608,580	89,840	56,200	24,000	54,820	161,930	2,660
Roebling's Sons Div., John A.	169,700	25,000	....	....	....	....	....
TOTAL	778,280	114,840	56,200	24,000	54,820	161,930	2,660
Continental Steel Corp.	265,000	60,000	51,500	31,000	70,000	45,000	10,000
Copperweld Steel Company	53,640	....	190	....	....	5,860	....
Cuyahoga Steel & Wire Co.	20,000	....	....	....	....	....	....
Davis Wire & Cable Corp., K. H.	15,000	2,700	....	....	....	3,000	....
Detroit Steel Corporation	135,000	25,000	....	....	....	75,000	....
Driscoll Wire Company	7,800	....	....	....	....	....	....
Driver Company, Wilbur B.	2,000	....	....	....	....	....	....
Edward Company, E. H.	13,500	3,600	....	....	....	2,970	3,830
Enterprise Wire Company	28,000	2,000	....	....	....	....	....
Gilbert & Bennett Mfg. Co.	30,200	13,500	....	....	....	26,500	....
Harper Company, H. M.	2,600	....	....	....	....	....	....
Igoe Brothers, Inc.	14,700	....	1,000	....	....	....	....
Ivy Steel & Wire Company	15,000	....	....	....	....	15,000	....
Jones & Laughlin Steel Corp.	318,000	68,000	66,000	15,000	14,000	....	....
Joslyn Mfg. & Supply Co.	6,000	....	....	....	....	....	....
Keystone Steel & Wire Co.	350,000	142,200	60,000	35,000	233,000	29,100	....
Mid-States Steel & Wire Co.	100,000	52,000	19,000	9,000	34,000	....	3,800
TOTAL	450,000	194,200	79,000	44,000	267,000	29,100	3,800
Laclede Steel Company	142,000	10,000	....	....	....	50,000	....
Macwhyte Company	10,500	600	....	....	....	....	....
Madison Wire Company, Inc.	6,000	....	....	....	....	....	....
Maryland Fine & Spec. Wire Co., Inc.	2,500	1,000	....	....	....	....	....
National-Standard Company	61,000	8,300	....	....	....	....	....
New England High Carbon Wire Co.	14,400	....	....	....	....	....	....
Northwestern Steel & Wire Co.	358,600	95,400	72,000	27,000	121,700	211,400	64,800
Pittsburgh Steel Company	324,000	100,000	....	....	....	100,000	....
Johnson Steel & Wire Co., Inc.	34,980	1,800	....	....	....	....	....
TOTAL	358,980	101,800	....	....	....	100,000	....
Porter Company, Inc., H. K.	11,100	....	....	....	....	....	....
Reed & Prince Manufacturing Co.	10,500	....	....	....	....	....	....
Reid-Avery Company, Inc.	16,000	....	....	....	....	....	....
Republic Steel Company	334,000	91,000	114,000	32,000	41,000	35,000	4,000
Rods, Inc.	6,000	....	....	....	....	....	....
Seaway Steel Corp.	24,000	....	....	....	....	....	....
Seneca Wire & Mfg. Co.	19,000	1,000	....	....	....	....	....
Sherman Steel & Wire Co.	2,900	1,500	....	....	....	....	....
Techalloy Company, Inc.	6,500	....	....	....	....	....	....
Thompson Wire Company	12,000	....	....	....	....	....	....
Townsend Company	27,000	....	....	....	....	....	....
United States Steel Corporation:							
American Steel & Wire Division	1,932,810	392,850	313,390	137,080	146,940	265,400	5,790
Columbia-Geneva Steel Division	143,670	38,500	81,980	7,510	9,010	....	1,970
Tennessee Coal and Iron Division	171,800	72,300	90,100	26,300	63,850	....	1,900
TOTAL	2,248,280	503,650	485,470	170,890	219,800	265,400	9,660
Universal-Cyclops Steel Corp.	6,000	....	....	....	....	....	....
Washburn Wire Company	20,700	....	....	....	....	....	....
Western Auto. Machine Screw Co.	12,000	....	....	....	....	....	....
Wheeling Steel Corporation	....	....	*12,000	....	....	....	....
Wickwire Brothers, Inc.	12,000	3,000	5,300	....	....	5,000	....
Wilson Steel & Wire Co.	35,000	10,000	15,000	....	....	....	....
Wire Sales Company	25,000	1,000	2,000	....	....	1,600	....
Wright Steel & Wire Co., G. F.	15,000	6,000	....	....	....	3,000	....
Youngstown Sheet & Tube Co.	72,000	6,000	....	....	....	....	....
GRAND TOTAL	7,256,320	1,613,890	1,155,960	388,790	835,570	1,115,760	123,050

*Includes cut nails.

Names and Addresses of U.S. Companies

(Continued)

Colonial Steel Co.
Div. of Vanadium-Alloys Steel Co.
Monaca, Pa.

Colorado Fuel & Iron Corp.
Continental Oil Bldg., Denver 2, Colo.

Columbia-Geneva Steel Div.
United States Steel Corp.
120 Montgomery St.
San Francisco 6, Calif.

Columbia Steel & Shafting Co.
P.O. Box 1557, Pittsburgh 30, Pa.

Columbia Tool Steel Co.
Lincoln Highway & State St.
Chicago Heights, Ill.

Compressed Steel Shafting Co.
1587 Hyde Park Ave.
Readville, Mass.

Connors Steel Div.
H. K. Porter Company Inc.
P.O. Box 2562, Birmingham, Ala.

Consolidated Western Steel Div.
United States Steel Corp.
Box 2015, Terminal Annex
Los Angeles 54, Calif.

Continental Steel Corp., Kokomo, Ind.

Copperweld Steel Co.
422 Frick Bldg., Pittsburgh 19, Pa.

Crucible Steel Co. of America
P.O. Box 88, Pittsburgh 30, Pa.

Cumberland Steel Co., Cumberland, Md.

Cuyahoga Steel & Wire Co.
Longwood Ave., Cleveland 5, Ohio

Damascus Tube Co., Greenville, Pa.

Davis Wire & Cable Corp., K. H.
6315 Bandini Blvd., Los Angeles 22

Detroit Steel Corp.
1025 S. Oakwood Ave., Detroit 9

Donner-Hanna Coke Corp.
Abby & Mystic Sts., Buffalo 20, N. Y.

Driscoll Wire Co., Shelton, Conn.

Driver Co., Wilbur B.
1875 McCarter Highway
Newark 4, N. J.

Eastern Stainless Steel Corp.
P.O. Box 1975, Baltimore 3, Md.

Eaton Mfg. Co., Reliance Div.
Massillon, Ohio

Edgewater Steel Co.
P.O. Box 478, Pittsburgh 30, Pa.

Edwards Co., E. H.
Butler Road & Industrial Way
South San Francisco, Calif.

Electroweld Steel Corp.
505 W. Foothill Blvd., Azusa, Calif.

Empire-Reeves Steel Corp.
Subsidiary of Universal-Cyclops Steel Corp.
Mansfield, Ohio

Enterprise Wire Co.
13157 Gregory St., Blue Island, Ill.

Erie Forge & Steel Corp.
1341 W. 16th St., Erie, Pa.

Finkl & Sons Co., A.
2011 Southport Ave., Chicago 14, Ill.

Firth Sterling Inc.
3113 Forbes St., Pittsburgh 13, Pa.

Fitzsimons Steel Co. Inc.
1623 Wilson Ave., Youngstown 1, Ohio

Florida Steel Corp.
Florida Electric Steel Mill Div.
P.O. Box 3321, Tampa, Fla.

Ford Motor Co.
American Road, Dearborn, Mich.

Formed Tubes Inc.
Prairie & Albert, Sturgis, Mich.

Fort Howard Steel & Wire Div.
Research Parts & Engineering Corp.
State & Ninth Sts., Green Bay, Wis.

Franklin Steel Div. Borg-Warner Corp.
Franklin, Pa.

Fretz-Moon Tube Co. Inc.
Box 551, Butler, Pa.

Gilbert & Bennett Mfg. Co. Inc.
Georgetown, Conn.

Granite City Steel Co.
20th & State Sts., Granite City, Ill.

Great Lakes Steel Corp.
Subsidiary of National Steel Corp.
Ecorse, Detroit 29, Mich.

Green River Steel Corp.
Subsidiary of Jessop Steel Co.
Owensboro, Ky.

Greer Steel Co., Dover, Ohio

Griffin Mfg. Co.
1515 Cherry St., Erie, Pa.

Gulf States Tube Corp.
Subsidiary of Michigan Seamless Tube Co., P.O. Box 952, Rosenberg, Tex.

Hanna Furnace Corp.
Subsidiary of National Steel Corp.
Ecorse, Detroit 29, Mich.

Harper Co., H. M.
8200 Lehigh Ave., Morton Groove, Ill.

Harris Tube Inc.
8720 S. San Pedro St., Los Angeles 3

Harrisburg Steel Co.
Division of Harsco Corp.
10th & Herr Sts., Harrisburg, Pa.

Harsco Corp.
10th & Herr Sts., Harrisburg, Pa.

Hawaiian Western Steel Ltd.
Box 2160, Honolulu, Hawaii

Heppenstall Co.
4620 Hatfield St., Pittsburgh 1, Pa.

Hind Steel Co. Inc.
2146 Stanley Terrace, Union, N. J.

Hofmann Industries Inc
Sinking Springs, Pa.

Igoe Bros. Inc.
234 Poinier St., Newark 5, N. J.

Indiana Steel & Wire Co. Inc.
P.O. Box 431, Muncie, Ind.

Industrial Forge & Steel Inc.
1502 Allen Ave. S.E., Canton 1, Ohio

Ingersoll Products Div.
Borg-Warner Corp.
1000 W. 120th St., Chicago 43, Ill.

Ingersoll Steel Div.
Borg-Warner Corp.
Broad St., New Castle, Ind.

Inland Steel Co.
30 W. Monroe St., Chicago 3, Ill.

Interlake Iron Corp.
1900 Union Commerce Bldg.
Cleveland 14, Ohio

International Harvester Co.
180 N. Michigan Ave., Chicago 1, Ill.

Isaacson Iron Works Inc.
P.O. Box 3625, Seattle 24, Wash.

Ivins Steel Tube Works Inc., Ellwood
Oak Lane Station
Philadelphia 26, Pa.

Ivy Steel & Wire Co.
3050 Melson Ave., Jacksonville 5, Fla.

Jackson Iron & Steel Co., Jackson, Ohio

James Steel & Tube Co.
P.O. Box 441, Royal Oak, Mich.

Jersey Shore Steel Co., Jersey Shore, Pa.

Jessop Steel Co., Washington, Pa.

Johnson Steel & Wire Co. Inc.
Subsidiary of Pittsburgh Steel Co.
53 Wiser Ave., Worcester 1, Mass.

Steel Ingots

STEELMAKING capacity, continuing its year to year increase in the U. S., reached another record level —148,570,970 net tons on Jan. 1, 1960.

Increase in furnace size and improved steelmaking technology have been making it possible to boost total capacity without a proportionate increase in the number of furnaces. In fact, there was a drop in the number of open hearths.

In the three years ended Jan. 1, 1960, the number of open hearths declined by 15, yet their total capacity rose 9,709,220 net tons. The number of electric steelmaking furnaces rose by 30 and climbed 2,354,200 tons. Growth of the oxygen converter process of making steel stands out. On Jan. 1, 1960, there were 12 such converters with a total capacity of 4,157,400 net tons compared with three converters and a capacity of 540,000 tons on Jan. 1, 1957.

Steel Ingot Capacity by Type and Company

	OPEN HEARTH		BESSEMER		BASIC OXYGEN PROCESS		ELECTRIC		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kinds:									
Open Hearth—Basic	874	125,867,040	....	.....	....	.....	....	.....	125,867,040
Open Hearth—Acid	32	754,590	....	.....	....	.....	....	.....	754,590
Bessemer	....	.....	31	3,396,000	....	.....	....	.....	3,396,000
Basic Oxygen Process	....	.....	....	.....	12	4,157,400	....	.....	4,157,400
Electric	....	.....	....	.....	....	.....	300	14,395,900	14,395,900
Crucible	....	.....	....	.....	....	.....	1	40	40
TOTAL	906	126,621,630	31	3,396,000	12	4,157,400	301	14,395,940	148,570,970
Companies:									
Acme Steel Co.	....	.....	....	.....	2	452,000	....	.....	452,000
Acme-Newport Steel Co.	7	325,000	....	.....	....	.....	3	283,000	608,000
TOTAL	7	325,000	....	.....	2	452,000	3	283,000	1,060,000
Alan Wood Steel Co.	9	800,000	....	.....	....	.....	....	.....	800,000
Alco Products, Inc.	3	105,850	....	.....	....	.....	1	2,800	108,650
Allegheny Ludlum Steel Corp.	5	324,000	....	.....	....	.....	30	588,000	912,000
American Compressed Steel Corp.	....	.....	....	.....	....	.....	1	21,600	21,600
Armco Steel Corp.	28	3,923,000	....	.....	....	.....	9	482,000	4,405,000
Sheffield Division	12	1,445,000	....	.....	....	.....	5	900,000	2,345,000
National Supply Co.	....	.....	....	.....	....	.....	3	50,000	50,000
TOTAL	40	5,368,000	....	.....	....	.....	17	1,432,000	6,800,000
Atlantic Steel Co.	....	.....	....	.....	....	.....	2	325,000	325,000
Babcock & Wilcox Co.	....	.....	....	.....	....	.....	5	321,730	321,730
Baldwin-Lima-Hamilton Corp.	5	169,920	....	.....	....	.....	(a) 2	18,790	188,710
Berkman Co., Louis:									
Ohio River Steel Division	4	136,080	....	.....	....	.....	....	.....	136,080
Bethlehem Steel Company	136	21,710,000	3	336,000	....	.....	11	954,000	23,000,000
Borg-Warner Corp.:									
Calumet Steel Division	....	.....	....	.....	....	.....	2	117,500	117,500
Ingersoll Steel Division	....	.....	....	.....	....	.....	4	64,000	64,000
TOTAL	....	.....	....	.....	....	.....	6	181,500	181,500
Braeburn Alloy Steel Corp.	....	.....	....	.....	....	.....	2	20,730	20,730
Byers Co., A. M.	....	.....	....	.....	....	.....	2	90,000	90,000
Cabot Shops, Inc.	....	.....	....	.....	....	.....	1	18,000	18,000
Cameron Iron Works, Inc.	....	.....	....	.....	....	.....	2	58,800	58,800
Carpenter Steel Co.	....	.....	....	.....	....	.....	7	87,500	87,500
Carpenter Steel of N. E., Inc.	....	.....	....	.....	....	.....	2	84,000	84,000
TOTAL	....	.....	....	.....	....	.....	9	171,500	171,500
Coco Steel Products Corp.	....	.....	....	.....	....	.....	3	150,000	150,000
Colorado Fuel & Iron Corp.	27	2,601,500	....	.....	....	.....	....	.....	2,601,500
Roebling's Sons Div., J. A.	9	235,000	....	.....	....	.....	....	.....	235,000
TOTAL	36	2,836,500	....	.....	....	.....	....	.....	2,836,500
Columbia Tool Steel Co.	....	.....	....	.....	....	.....	2	6,600	6,600
Continental Steel Corp.	5	420,000	....	.....	....	.....	....	.....	420,000
Copperweld Steel Co.	....	.....	....	.....	....	.....	8	660,000	660,000
Crucible Steel Company of America	9	1,044,000	....	.....	....	.....	26	389,180	1,433,180
Detroit Steel Corp.	5	1,000,000	....	.....	....	.....	....	.....	1,000,000
Eastern Stainless Steel Corp.	....	.....	....	.....	....	.....	5	72,960	72,960
Edgewater Steel Co.	2	117,600	....	.....	....	.....	....	.....	117,600
Erie Forge & Steel Corp.	5	234,000	....	.....	....	.....	1	50,000	284,000
Finkl & Sons Co., A.	....	.....	....	.....	....	.....	2	33,600	33,600
Firth Sterling, Inc.	....	.....	....	.....	....	.....	3	20,040	20,040
Florida Steel Corp.	....	.....	....	.....	....	.....	1	51,000	51,000
Ford Motor Co.	10	1,720,000	....	.....	....	.....	5	220,000	1,940,000
Granite City Steel Co.	7	1,440,000	....	.....	....	.....	....	.....	1,440,000
Harper Co., H. M.	....	.....	....	.....	....	.....	2	11,700	11,700
Harrisburg Steel Co. Division Harsco Corp.	3	100,750	....	.....	....	.....	....	.....	100,750
Heppenstall Co.	2	50,470	....	.....	....	.....	1	5,080	55,550
Midvale-Heppenstall Co.	....	.....	....	.....	....	.....	3	175,000	175,000
TOTAL	2	50,470	....	.....	....	.....	4	180,080	230,550
Industrial Forge & Steel, Inc.	2	79,200	....	.....	....	.....	....	.....	79,200
Inland Steel Co.	43	6,500,000	....	.....	....	.....	....	.....	6,500,000
International Harvester Co.	11	1,200,000	....	.....	....	.....	....	.....	1,200,000
Isaacson Iron Works	....	.....	....	.....	....	.....	2	102,000	102,000
Jessop Steel Co.	....	.....	....	.....	....	.....	4	35,800	35,800
Green River Steel Corp.	....	.....	....	.....	....	.....	2	183,190	183,190
TOTAL	....	.....	....	.....	....	.....	6	218,990	218,990
Jones & Laughlin Steel Corp.	37	6,139,000	3	384,000	2	880,000	9	722,000	8,125,000
Joslyn Mfg. & Supply Co.:									
Joslyn Stainless Steels Div.	....	.....	....	.....	....	.....	3	37,500	37,500
Judson Steel Corp.	3	76,500	....	.....	....	.....	....	.....	76,500
Kaiser Steel Corp.	9	1,493,000	....	.....	3	1,440,000	....	.....	2,933,000
Keystone Steel & Wire Co.	5	600,000	....	.....	....	.....	....	.....	600,000
Kilby Steel Co.	....	.....	....	.....	....	.....	1	34,020	34,020
Knoxville Iron Co.	....	.....	....	.....	....	.....	2	38,000	38,000
Laclede Steel Co.	4	600,000	....	.....	....	.....	....	.....	600,000
Latrobe Steel Co.	....	.....	....	.....	....	.....	5	24,000	24,000
Le Tourneau, Inc., R. G.	....	.....	....	.....	....	.....	3	90,000	90,000
Lone Star Steel Co.	5	800,000	....	.....	....	.....	....	.....	800,000
Lukens Steel Co.	12	750,000	....	.....	....	.....	1	180,000	930,000
McLouth Steel Corp.	....	.....	....	.....	5	1,385,400	4	654,600	2,040,000
Merritt-Chapman & Scott Corp.:									
Milton Steel Division	....	.....	....	.....	....	.....	3	110,000	110,000
Mesta Machine Co.	8	151,000	....	.....	....	.....	1	20,000	171,000
Mississippi Steel Corp.	....	.....	....	.....	....	.....	1	45,000	45,000
National Forge Co.	....	.....	....	.....	....	.....	3	25,000	25,000
National Steel Corp.:									
Great Lakes Steel Corp.	17	3,700,000 (b)	2	.....	....	.....	....	.....	3,700,000
Weirton Steel Division	14	3,300,000 (b)	3	.....	....	.....	....	.....	3,300,000
TOTAL	31	7,000,000 (b)	5	.....	....	.....	....	.....	7,000,000
Newport News Shipbuilding & Dry Dock Co.	....	.....	....	.....	....	.....	3	15,000	15,000
Northwest Steel Rolling Mills, Inc.	....	.....	....	.....	....	.....	2	53,000	53,000
Northwestern Steel & Wire Co.	....	.....	....	.....	....	.....	5	825,000	825,000
Oregon Steel Mills	....	.....	....	.....	....	.....	3	150,000	150,000
Pacific States Steel Corp.	4	265,000	....	.....	....	.....	....	.....	265,000
Penncyd Steel & Forge Corp.	....	.....	....	.....	....	.....	1	15,600	15,600
Phoenix Steel Corp.	11	806,760	....	.....	....	.....	1	40,000	846,760
Pittsburgh Steel Co.	12	1,620,000	....	.....	....	.....	....	.....	1,620,000
Porter Co., Inc., H. K.:									
Connors Steel Division	....	.....	....	.....	....	.....	4	267,000	267,000
Vulcan Kidd Steel Division	....	.....	....	.....	....	.....	2	9,600	9,600
TOTAL	....	.....	....	.....	....	.....	6	276,600	276,600
Republic Steel Corp.	80	9,794,000	2	529,000	....	.....	23	2,419,000	12,742,000
Roanoke Electric Steel Corp.	....	.....	....	.....	....	.....	1	25,000	25,000
Sharon Steel Corp.	17	1,795,000	....	.....	....	.....	3	168,000	1,963,000
Simonds Saw & Steel Co.	....	.....	....	.....	....	.....	3	21,600	21,600
Southern Electric Steel Co.	....	.....	....	.....	....	.....	2	66,000	66,000
Southwest Steel Rolling Mills	....	.....	....	.....	....	.....	2	100,000	100,000
Texas Steel Co.	....	.....	....	.....	....	.....	4	192,280	192,280
Timken Roller Bearing Co.	....	.....	....	.....	....	.....	9	700,000	700,000
Union Electric Steel Corp.	....	.....	....	.....	....	.....	2	25,000	25,000
United States Steel Corp.:									
United States Steel Corp. (Central Operations)	177	27,829,000 (c)	8	653,000	....	.....	10	462,000	28,944,000

Jones & Laughlin Steel Corp.
3 Gateway Center, Pittsburgh 30, Pa.
Joslyn Stainless Steels Div.
Joslyn Mfg. & Supply Co.
155 N. Wacker Dr., Chicago 6, Ill.
Judson Steel Corp.
4200 Eastshore Highway
Emeryville, Calif.

Kaiser Steel Corp., Kaiser Center
300 Lakeside Dr., Oakland 12, Calif.
Kane Boiler Works Inc.
P.O. Box 546, Galveston, Tex.
Keokuk Electro-Metals Co.
Div. of Vanadium Corp. of America
Keokuk, Iowa
Keystone Drawn Steel Co.
Main & Bridge Sts., Spring City, Pa.
Keystone Steel & Wire Co.
Peoria 7, Ill.
Kilby Steel Co., Anniston, Ala.
Knoxville Iron Co., Knoxville 2, Tenn.
Kuehne Mfg. Co.
19th & Olive Sts., Mattoon, Ill.

Laclede Steel Co.
Arcade Bldg., St. Louis 1, Mo.
LaSalle Steel Co.
130 E. Randolph Dr., Chicago 1, Ill.
Latrobe Steel Co.
2626 Ligonier St., Latrobe, Pa.
Lavino & Co., E. J.
3 Penn Center Plaza, Philadelphia 2
Leschen Wire Rope Div.
H. K. Porter Co. Inc., St. Louis
Le Tourneau Inc., R. G., Longview, Tex.
Lockhart Iron & Steel Co.
P.O. Box 1165, Pittsburgh 30, Pa.
Lone Star Steel Co.
W. Mockingbird Lane at Roper
Box 12226, Dallas 25, Tex.
Lukens Steel Co., Coatesville, Pa.

Macwhyte Co.
2906 14th Ave., Kenosha, Wis.

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	OPEN HEARTH		BESSEMER		BASIC OXYGEN PROCESS		ELECTRIC		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Companies (Cont.)									
American Steel & Wire Division	22	1,988,000	....	.....	....	.....	....	.....	1,988,000
Columbia-Geneva Steel Division	19	2,917,000	....	.....	....	.....	....	.....	2,917,000
National Tube Division	15	3,146,000	6	924,000	....	.....	....	.....	4,070,000
Tennessee Coal & Iron Division	23	3,997,000 (b)	3	.....	....	.....	....	.....	3,997,000
TOTAL	256	39,877,000	17	1,577,000	....	.....	10	462,000	41,916,000
Universal-Cyclops Steel Corp.	....	.....	....	.....	....	.....	10	77,410	77,410
Empire-Reeves Steel Corp.	7	500,000	....	.....	....	.....	....	.....	500,000
TOTAL	7	500,000	....	.....	....	.....	10	77,410	577,410
Vanadium-Alloys Steel Co.	....	.....	....	.....	....	.....	5	12,000	12,000
Colonial Steel Co.	....	.....	....	.....	....	.....	2	30,000	30,000
TOTAL	....	.....	....	.....	....	.....	7	42,000	42,000
Washburn Wire Co.	4	93,000	....	.....	....	.....	....	.....	93,000
Western Rolling Mills Div. Yuba Consolidated Industries, Inc.	....	.....	....	.....	....	.....	2	60,000	60,000
Wheeling Steel Corp.	11	1,830,000	2	570,000	....	.....	....	.....	2,400,000
Wickwire Brothers, Inc.	....	.....	....	.....	....	.....	2	28,730	28,730
Youngstown Sheet and Tube Co.	41	6,750,000	....	.....	....	.....	....	.....	6,750,000
GRAND TOTAL	906	126,621,630	32	3,396,000	12	4,157,400	301	14,395,940	148,570,970

Steel Ingot Capacity by Plant Location and Operating Company

Plant Location and Operating Company:									
Alabama									
Anniston									
Kilby Steel Co.	....	.....	....	.....	....	.....	1	34,020	34,020
Birmingham									
Porter Co. Inc., H. K.:									
Connors Steel Div.	....	.....	....	.....	....	.....	3	150,000	150,000
Southern Electric Steel Co.	....	.....	....	.....	....	.....	2	66,000	66,000
Ensley									
Tennessee Coal & Iron Div.	9	1,770,000 (b)	3	.....	....	.....	....	.....	1,770,000
Fairfield									
Tennessee Coal & Iron Div.	14	2,227,000	....	.....	....	.....	....	.....	2,227,000
Gadsden									
Republic Steel Corp.	8	789,000	....	.....	....	.....	2	420,000	1,209,000
TOTAL	31	4,786,000 (b)	3	.....	....	.....	8	670,020	5,456,020
Arizona									
Helena									
Western Rolling Mills Div.	....	.....	....	.....	....	.....	2	60,000	60,000
California									
Emeryville									
Judson Steel Corp.	3	76,500	....	.....	....	.....	....	.....	76,500
Fontana									
Kaiser Steel Corp.	9	1,493,000	....	.....	3	1,440,000	....	.....	2,933,000
Los Angeles									
Bethlehem Steel Co.	....	.....	....	.....	....	.....	3	478,000	478,000
Southwest Steel Rolling Mills	....	.....	....	.....	....	.....	2	100,000	100,000
Pittsburg									
Columbia-Geneva Steel Div.	5	380,000	....	.....	....	.....	....	.....	380,000
South San Francisco									
Bethlehem Steel Co.	5	276,000	....	.....	....	.....	....	.....	276,000
Torrance									
Columbia-Geneva Steel Div.	4	237,000	....	.....	....	.....	....	.....	237,000
National Supply Co.	....	.....	....	.....	....	.....	3	50,000	50,000
Union City									
Pacific States Steel Corp.	4	265,000	....	.....	....	.....	....	.....	265,000
TOTAL	30	2,727,500	....	.....	3	1,440,000	8	628,000	4,795,500
Colorado									
Pueblo									
Colorado Fuel and Iron Corp.	17	1,800,000	....	.....	....	.....	....	.....	1,800,000
Connecticut									
Bridgeport									
Carpenter Steel of N. E. Inc.	....	.....	....	.....	....	.....	2	84,000	84,000
Delaware									
Claymont									
Colorado Fuel & Iron Corp.	7	506,500	....	.....	....	.....	....	.....	506,500
Florida									
Tampa									
Florida Steel Corp.	....	.....	....	.....	....	.....	1	51,000	51,000
Georgia									
Atlanta									
Atlantic Steel Co.	....	.....	....	.....	....	.....	2	325,000	325,000
Illinois									
Alton									
Laclede Steel Co.	4	600,000	....	.....	....	.....	....	.....	600,000
Chicago									
Acme Steel Co.	....	.....	....	.....	2	452,000	....	.....	452,000
Finkl & Sons Co., A.	....	.....	....	.....	....	.....	2	33,600	33,600
International Harvester Co.	11	1,200,000	....	.....	....	.....	....	.....	1,200,000
Republic Steel Corp.	4	675,000	....	.....	....	.....	9	1,094,000	1,769,000
United States Steel Corp. (Central Operations)	31	5,327,000	3	100,000	....	.....	3	162,000	5,589,000
Chicago Heights									
Borg-Warner Corp. Calumet Steel Division	....	.....	....	.....	....	.....	2	117,500	117,500
Columbia Tool Steel Co.	....	.....	....	.....	....	.....	2	6,600	6,600
Granite City									
Granite City Steel Co.	7	1,440,000	....	.....	....	.....	....	.....	1,440,000
Lemont									
Ceco Steel Products Corp.	....	.....	....	.....	....	.....	3	150,000	150,000
Morton Grove									
Harper Co., H. M.	....	.....	....	.....	....	.....	2	11,700	11,700
Peoria									
Keystone Steel & Wire Co.	5	600,000	....	.....	....	.....	....	.....	600,000
Sterling									
Northwestern Steel & Wire Co.	....	.....	....	.....	....	.....	5	825,000	825,000
TOTAL	62	9,842,000	3	100,000	2	452,000	28	2,400,400	12,794,400
Indiana									
East Chicago									
Inland Steel Company	43	6,500,000	....	.....	....	.....	....	.....	6,500,000
Youngstown Sheet and Tube Co.	17	3,420,000	....	.....	....	.....	....	.....	3,420,000
Fort Wayne									
Jonlyn Stainless Steels Div.	....	.....	....	.....	....	.....	3	37,500	37,500
Gary									
United States Steel Corp. (Central Operations)	55	7,999,000 (b)	3	.....	....	.....	....	.....	7,999,000
Kokomo									
Continental Steel Corp.	5	420,000	....	.....	....	.....	....	.....	420,000
New Castle									
Borg-Warner Corp. Ingersoll Steel Div.	....	.....	....	.....	....	.....	4	64,000	64,000
TOTAL	120	18,339,000 (b)	3	.....	....	.....	7	101,500	18,440,500

Names and Addresses of U.S. Companies

(Continued)

McInnes Steel Co.
441 E. Main St., Corry, Pa.
McLouth Steel Corp.
300 S. Livernois Ave., Detroit 17
Madison Wire Co. Inc.
324 Indian Church Rd., Buffalo, N. Y.
Mahoning Valley Steel Co.
McKees Lane, Niles, Ohio
Mark & Co., Clayton
1900 Dempster St., Evanston, Ill.
Maryland Fine & Specialty Wire Co. Inc.
Cockeysville, Md.
Master Tank & Welding Ltd.
1612 Singleton Blvd., Dallas, Tex.
Merritt-Chapman & Scott Corp.
261 Madison Ave., New York 16
Mesta Machine Co.
P.O. Box 1466, Pittsburgh 30, Pa.
Metal Forming Corp.
Div. of Vanadium-Alloys Steel Co.
Elkhart, Ind.
Metal & Thermit Corp.
100 Park Ave., New York 17, N. Y.
Miami Industries Inc.
North Dixie Highway, Piqua, Ohio
Michigan Seamless Tube Co.
400 West St., South Lyon, Mich.
Mid-States Steel & Wire Co.
Subsidiary of Keystone Steel & Wire Co.
410 S. Oak St., Crawfordsville, Ind.
Midvale-Heppenstall Co.
Subsidiary of Heppenstall Co.
Nicetown, Philadelphia 40, Pa.
Midwest Steel Corp.
Subsidiary of National Steel Corp.
Portage, Ind.
Mill Strip Products Co.
2420 Oakton St., Evanston, Ill.
Milton Steel Div.
Merritt-Chapman & Scott Corp.
Milton, Pa.
Mississippi Steel Corp.
P.O. Box 5508, Pearl Branch
Jackson 8, Miss.
Missouri Rolling Mill Corp.
6800 Manchester Ave., St. Louis 10
Moltrup Steel Products Co.
Beaver Falls, Pa.
Molybdenum Corp. of America
Washington, Pa.
Monroe Auto Equipment Co.
1426 E. First St., Monroe, Mich.
Monsanto Chemical Co.
800 N. Lindbergh Blvd.
St. Louis 66, Mo.
Motyka Metal Products Tubing Div. Inc.
Ludington, Mich.

National Forge Co., Irvine, Pa.
National-Standard Co., Niles, Mich.
National Steel Corp.
2800 Grant Bldg., Pittsburgh 19, Pa.
National Supply Co.
Subsidiary of Armco Steel Corp.
P.O. Box 416, Pittsburgh 30, Pa.
National Tube Div.
United States Steel Corp.
525 William Penn Place
Pittsburgh 30, Pa.
Naylor Pipe Co.
1230 E. 92nd St., Chicago 19, Ill.
Nelsen Steel & Wire Co.
9400 Belmont Ave., Franklin Park, Ill.
New England High Carbon Wire Corp.
50 Howe Ave., Millbury, Mass.
New Jersey Zinc Co. (of Pa.)
160 Front St., New York 38, N. Y.
Newman-Crosby Steel Co.
10 Dean St., Pawtucket, R. I.
Nikoh Tube Co.
5000 S. Whipple St., Chicago 32, Ill.
Northern Steel Inc.
1 State St., Boston 9, Mass.
Northwest Steel Rolling Mills Inc.
4315 Ninth Ave. N.W., Seattle 7, Wash.
Northwestern Steel & Wire Co.
Avenue B & Wallace St.
Sterling, Ill.

Ohio Ferro-Alloys Corp.
839 30th St. N.W., Canton, Ohio
Ohio River Steel Div.
Louis Berkman Co., Steubenville, Ohio
Ohio Seamless Tube Div.
Copperweld Steel Co., Shelby, Ohio
Oklahoma Steel Corp.
P.O. Box 2462, Oklahoma City 8, Okla.
Oregon Steel Mills
5250 N.W. Front Ave.
Portland 10, Oreg.

Pacific States Steel Corp.
Union City, Calif.
Pacific Tube Co.
5710 Smithway St., Los Angeles 22
Page Steel & Wire Div.
American Chain & Cable Co. Inc.
Monessen, Pa.
Pencoyd Steel & Forge Corp.
3720 Main St., Philadelphia 27, Pa.

Phoenix Mfg. Co.
P.O. Box 1207, Joliet, Ill.
Phoenix Steel Corp.
25 Broad St., New York, N. Y.
(Plant at Phoenixville, Pa.)
Pilgrim Drawn Steel Div.
Automotive Materials Corp.
1000 General Dr., Plymouth, Mich.
Pittsburgh Coke & Chemical Co.
2000 Grant Bldg., Pittsburgh 19, Pa.
Pittsburgh Metallurgical Co. Inc.
3801 Highland Ave.
Niagara Falls, N. Y.
Pittsburgh Steel Co.
1600 Grant Bldg.
P.O. Box 118, Pittsburgh 30, Pa.
Pittsburgh Tool Steel Wire Co.
Div. of Vanadium-Alloys Steel Co.
Monaca, Pa.
Pittsburgh Tube Co.
212 Wood St., Pittsburgh 22, Pa.
Plymouth Steel Corp.
6143 Epworth Blvd., Detroit 10, Mich.
Pollak Steel Co.
P.O. Box 237, Cincinnati 15, Ohio
Poor & Co. Inc.
Rail Joint Co. Div.
50 Church St., New York 7, N. Y.
Porter Company Inc., H. K.
Porter Bldg., Pittsburgh 19, Pa.
Precision Drawn Steel Co.
3600 River Road, Camden, N. J.

Reed & Prince Mfg. Co.
1 Duncan Ave., Worcester 1, Mass.
Reid-Avery Co. Inc.
Dundalk, Baltimore 22, Md.
Republic Steel Corp.
Republic Bldg., Cleveland 1, Ohio
Rodney Metals Inc.
261 Fifth Ave., New York 16, N. Y.
Rods Inc.
706 Folger Ave., Berkeley 10, Calif.
Roebling's Sons Div., John A.
Colorado Fuel & Iron Corp.
Trenton, N. J.
Rome Mfg. Co. Div.
Revere Copper & Brass Inc.
201-203 Mill St., Rome, N. Y.
Rome Strip Steel Co. Inc.
530 Henry St., Rome, N. Y.

Sawhill Tubular Products Inc.
Sharon, Pa.
Seaway Steel Corp.
101 East Ave.
North Tonawanda, N. Y.
Seneca Wire & Mfg. Co.
P.O. Box 71, S. Vine St.
Fostoria, Ohio
Service Steel Div., Van Pelt Corp.
13700 Sherwood Ave., Detroit 32
Sharon Steel Corp., Sharon, Pa.
Sharon Tube Co.
134 Mill St., Sharon, Pa.
Sheffield Div., Armco Steel Corp.
Sheffield Station, Kansas City 3, Mo.
Shenango Furnace Co.
812 Oliver Bldg., Pittsburgh 22, Pa.
Sherman Steel & Wire Co.
1300 Pacific St., Sherman, Tex.
Shwayder Bros. Inc.
4270 High St., Detroit 29, Mich.
Simmons Co.
300 Park Ave., New York 22, N. Y.
Simonds Saw & Steel Co.
470 Main St., Fitchburg, Mass.
Smith Corp., A. O.
3533 N. 27th St., Milwaukee 1, Wis.
Smith Corp. of Texas, A. O.
Houston, Tex.
Southeastern Metals Co. Inc.
3925 N. 29th St.
North Birmingham, Ala.
Southern Electric Steel Co.
2301 Huntsville Rd., Birmingham, Ala.
Southern Fabricating Co. Inc.
818 20th St., Sheffield, Ala.
Southern Pipe Div.
U. S. Industries Inc.
P.O. Box C, Azusa, Calif.
Southwest Steel Rolling Mills
9901 S. Alameda St., Los Angeles
Standard Forgings Corp.
80 E. Jackson Blvd., Chicago 4, Ill.
Standard Tube Co.
24400 Plymouth Rd., Detroit 39, Mich.
Stanley Works, New Britain, Conn.
State Industries
4019 Medford St., Los Angeles 63
Structural Metals Inc.
P.O. Box 911, Seguin, Tex.
Superior Drawn Steel Co.
Div. of Standard Steel Specialty Co.
Monaca, Pa.
Superior Steel Div., Copperweld Steel Co.
Carnegie, Pa.
Superior Tube Co., Norristown, Pa.
Sweet's Steel Co., Williamsport, Pa.

Taylor Forge & Pipe Works
4735 W. 14th St., Chicago, Ill.
Techalloy Co. Inc., Rahns, Pa.
Tennessee Coal & Iron Div.
United States Steel Corp.
Box 599, Fairfield, Ala.
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	OPEN HEARTH		BESSEMER		BASIC OXYGEN PROCESS		ELECTRIC		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kentucky									
Ashland									
Armco Steel Corporation	8	1,038,000							1,038,000
Newport									
Acme-Newport Steel Co	7	325,000					3	283,000	608,000
Owensboro									
Jessop Steel Company									
Green River Steel Corp							2	183,190	183,190
TOTAL	15	1,363,000					5	466,190	1,829,190
Maryland									
Baltimore									
Armco Steel Corporation							6	108,000	108,000
Eastern Stainless Steel Corp							5	72,960	72,960
Sparrows Point									
Bethlehem Steel Co	35	7,864,000	3	336,000					8,200,000
TOTAL	35	7,864,000	3	336,000			11	180,960	8,380,960
Michigan									
Dearborn									
Ford Motor Company	10	1,720,000					5	220,000	1,940,000
Ecorse									
Great Lakes Steel Corp	17	3,700,000 (b)	2						3,700,000
Ferndale									
Allegheny Ludlum Steel Corp							5	4,000	4,000
Trenton									
McLouth Steel Corp					5	1,385,400	4	654,600	2,040,000
Warren									
Jones & Laughlin Steel Corp							6	300,000	300,000
TOTAL	27	5,420,000 (b)	2		5	1,385,400	20	1,178,600	7,984,000
Minnesota									
Duluth									
American Steel & Wire Div	9	973,000							973,000
Mississippi									
Jackson									
Mississippi Steel Corp							1	45,000	45,000
Missouri									
Kansas City									
Sheffield Division	4	420,000					2	420,000	840,000
New Jersey									
Harrison									
Crucible Steel Company of America							6	7,800	7,800
Roebling									
Roebling's Sons Div., J. A.	9	235,000							235,000
TOTAL	9	235,000					6	7,800	242,800
New York									
Buffalo									
Republic Steel Corp	9	900,000							900,000
Cortland									
Wickwire Brothers, Inc							2	28,730	28,730
Dunkirk									
Allegheny Ludlum Steel Corp							3	33,000	33,000
Lackawanna									
Bethlehem Steel Co	35	6,000,000							6,000,000
Lockport									
Simonds Saw & Steel Co							3	21,600	21,600
Syracuse									
Crucible Steel Company of America							11	61,380	61,380
Tonawanda									
Allegheny Ludlum Steel Corp							2	4,000	4,000
Colorado Fuel & Iron Corp	3	295,000							295,000
Watervliet									
Allegheny Ludlum Steel Corp							7	76,300	76,300
TOTAL	47	7,195,000					28	225,010	7,420,010
Ohio									
Campbell									
Youngstown Sheet and Tube Co	12	1,800,000							1,800,000
Canton									
Industrial Forge & Steel, Inc	2	79,200							79,200
Republic Steel Corp	6	560,000					10	485,000	1,045,000
Timken Roller Bearing Co							9	700,000	700,000
Cincinnati									
American Compressed Steel Corp							1	21,600	21,600
Cleveland									
Jones & Laughlin Steel Corp	11	1,525,000					2	420,000	1,945,000
Republic Steel Corp	21	3,490,000							3,490,000
Lorain									
National Tube Div	12	1,778,000	3	900,000					2,678,000
Lowellville									
Sharon Steel Corp	5	521,000					2	72,000	593,000
Mansfield									
Empire-Reeves Steel Corp	7	500,000							500,000
Massillon									
Republic Steel Corp	9	680,000							680,000
Middletown									
Armco Steel Corp	14	2,400,000					2	300,000	2,700,000
Portsmouth									
Detroit Steel Corp	5	1,000,000							1,000,000
Steubenville									
Wheeling Steel Corp	11	1,830,000	2	570,000					2,400,000
Toronto									
Louis Berkman Co., Ohio River Steel Div	4	136,080							136,080
Warren									
Copperweld Steel Co							8	660,000	660,000
Republic Steel Corp	8	1,100,000					2	420,000	1,520,000
Youngstown									
Republic Steel Corp	15	1,600,000	2	529,000					2,129,000
United States Steel Corp.:									
(Central Operations)	15	2,159,000	2	553,000					2,712,000
Youngstown Sheet and Tube Co	12	1,530,000							1,530,000
TOTAL	169	22,668,280	9	2,552,000			36	3,078,600	28,318,880
Oklahoma									
Sand Springs									
Sheffield Division							1	140,000	140,000
Oregon									
Portland									
Oregon Steel Mills							3	150,000	150,000
Pennsylvania									
Aliquippa									
Jones & Laughlin Steel Corp	5	1,164,000	3	384,000	2	880,000			2,428,000
Porter Co., Inc., H. K.:									
Vulcan-Kidd Steel Div							2	9,600	9,600
Ambridge									
Byers Company, A. M							2	90,000	90,000
Beaver Falls									
Babcock & Wilcox Co							5	321,730	321,730
Bethlehem									
Bethlehem Steel Co	29	3,670,000					6	230,000	3,900,000
Brackenridge									
Allegheny Ludlum Steel Corp	5	324,000					13	470,700	794,700
Braddock									
United States Steel Corp.:									
(Central Operations)	16	2,529,000							2,529,000
Braeburn									
Braeburn Alloy Steel Corp							2	20,730	20,730

	OPEN HEARTH		BESSEMER		BASIC OXYGEN PROCESS		ELECTRIC		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Pennsylvania (Continued)									
Bridgeville									
Universal-Cyclops Steel Corp.	....	.....	....	.....	....	.....	10	77,410	77,410
Burnham									
Baldwin-Lima-Hamilton Corp.	5	169,920	....	.....	....	.....(a)	2	18,790	188,710
Butler									
Armco Steel Corp.	6	485,000	....	.....	....	.....	1	74,000	559,000
Carnegie									
Union Electric Steel Corp.	....	.....	....	.....	....	.....	2	25,000	25,000
Clairton									
United States Steel Corp.:									
(Central Operations)	12	1,064,000	....	.....	....	.....	....	.....	1,064,000
Coatesville									
Lukens Steel Co.	12	750,000	....	.....	....	.....	1	180,000	930,000
Donora									
American Steel & Wire Div.	13	1,015,000	....	.....	....	.....	....	.....	1,015,000
Duquesne									
United States Steel Corp.:									
(Central Operations)	12	1,447,000	....	.....	....	.....	5	294,000	1,741,000
Erie									
Erie Forge & Steel Corp.	5	234,000	....	.....	....	.....	1	50,000	284,000
Fairless Hills									
United States Steel Corp.:									
(Central Operations)	9	2,687,000	....	.....	....	.....	....	.....	2,687,000
Farrell									
Sharon Steel Corp.	12	1,274,000	....	.....	....	.....	1	96,000	1,370,000
Harrisburg									
Harrisburg Steel Co.	3	100,750	....	.....	....	.....	....	.....	100,750
Phoenix Steel Corp.	6	446,760	....	.....	....	.....	1	40,000	486,760
Irvine									
National Forge Co.	....	.....	....	.....	....	.....	3	25,000	25,000
Ivy Rock									
Alan Wood Steel Co.	9	800,000	....	.....	....	.....	....	.....	800,000
Johnstown									
Bethlehem Steel Co.	20	2,400,000	....	.....	....	.....	....	.....	2,400,000
United States Steel Corp.:									
(Central Operations)	2	19,000	....	.....	....	.....	2	6,000	25,000
Latrobe									
Alco Products, Inc.	3	105,850	....	.....	....	.....	1	2,800	108,650
Latrobe Steel Co.	....	.....	....	.....	....	.....	5	24,000	24,000
Vanadium-Alloys Steel Co.	....	.....	....	.....	....	.....	5	12,000	12,000
McKeesport									
Firth Sterling, Inc.	....	.....	....	.....	....	.....	3	20,040	20,040
National Tube Div.	3	1,368,000	3	24,000	....	.....	....	.....	1,392,000
Midland									
Crucible Steel Company of America	9	1,044,000	....	.....	....	.....	9	320,000	1,364,000
Milton									
Milton Steel Div.									
Merritt-Chapman & Scott Corp.	....	.....	....	.....	....	.....	3	110,000	110,000
Monaca									
Colonial Steel Co.	....	.....	....	.....	....	.....	2	30,000	30,000
Monessen									
Pittsburgh Steel Co.	12	1,620,000	....	.....	....	.....	....	.....	1,620,000
Munhall									
United States Steel Corp.:									
(Central Operations)	25	4,598,000	....	.....	....	.....	....	.....	4,598,000
New Castle									
Mesta Machine Co.	4	66,000	....	.....	....	.....	....	.....	66,000
Oakmont									
Edgewater Steel Co.	2	117,600	....	.....	....	.....	....	.....	117,600
Philadelphia									
Midvale-Heppenstall Co.	....	.....	....	.....	....	.....	3	175,000	175,000
Penn-Ideal Steel & Forge Corp.	....	.....	....	.....	....	.....	1	15,600	15,600
Phoenixville									
Phoenix Steel Corp.	5	360,000	....	.....	....	.....	....	.....	360,000
Pittsburgh									
Heppenstall Co.	2	50,470	....	.....	....	.....	1	5,080	55,550
Jones & Laughlin Steel Corp.	21	3,450,000	....	.....	....	.....	1	2,000	3,452,000
Reading									
Carpenter Steel Co.	....	.....	....	.....	....	.....	7	87,500	87,500
Steelton									
Bethlehem Steel Co.	12	1,500,000	....	.....	....	.....	....	.....	1,500,000
Washington									
Jessop Steel Company	....	.....	....	.....	....	.....	4	35,800	35,800
West Homestead									
Mesta Machine Co.	4	85,000	....	.....	....	.....	1	20,000	105,000
TOTAL	283	34,944,350	6	408,000	2	880,000	105	2,888,780	39,121,130
Rhode Island									
Phillipsdale									
Washburn Wire Co.	4	93,000							93,000
Tennessee									
Knoxville									
Knoxville Iron Co.	....	.....	....	.....	....	.....	2	38,000	38,000
Texas									
Fort Worth									
Texas Steel Company	....	.....	....	.....	....	.....	4	192,280	192,280
Houston									
Cameron Iron Works, Inc.	....	.....	....	.....	....	.....	2	58,800	58,800
Sheffield Division	8	1,025,000	....	.....	....	.....	2	340,000	1,365,000
Lone Star									
Lone Star Steel Company	5	800,000	....	.....	....	.....	....	.....	800,000
Longview									
Le Tourneau, Inc., R. G.	....	.....	....	.....	....	.....	3	90,000	90,000
Pampa									
Cabot Shops, Inc.	....	.....	....	.....	....	.....	1	18,000	18,000
TOTAL	13	1,825,000					12	699,080	2,524,080
Utah									
Geneva									
Columbia-Geneva Steel Div.	10	2,300,000							2,300,000
Virginia									
Newport News									
Newport News Shipbldg. & Dry Dock Company	....	.....	....	.....	....	.....	3	15,000	15,000
Roanoke									
Roanoke Electric Steel Corp.	....	.....	....	.....	....	.....	1	25,000	25,000
TOTAL							4	40,000	40,000
Washington									
Seattle									
Bethlehem Steel Co.	....	.....	....	.....	....	.....	2	246,000	246,000
Isaacson Iron Works	....	.....	....	.....	....	.....	2	102,000	102,000
Northwest Steel Rolling Mills, Inc.	....	.....	....	.....	....	.....	2	53,000	53,000
TOTAL							6	401,000	401,000
West Virginia									
Huntington									
Connors Steel Div.	....	.....	....	.....	....	.....	1	117,000	117,000
Weirton									
Weirton Steel Div.	14	3,300,000 (b)	3	.....	....	.....	....	.....	3,300,000
TOTAL	14	3,300,000 (b)	3	.....	....	.....	1	117,000	3,417,000
GRAND TOTAL	906	126,621,630	32	3,396,000	12	4,157,400	301	14,395,940	148,570,970

(a) Includes 1 crucible furnace, annual capacity 40 tons.
(b) Bessemer converters used in melting charge for open hearth furnaces.
(c) Includes 3 bessemer converters used only in melting charge for open hearth furnaces.

Names and Addresses of U.S. Companies

(Continued)

Tennessee Products & Chemical Corp.
Subsidiary of Merritt-Chapman & Scott Corp., 2611 West End Ave.
Nashville 5, Tenn.
Tenn-Tex Alloy & Chemical Corp.
Subsidiary of Tennessee Products & Chemical Corp., Houston, Tex.
Texas Steel Co.
3901 Hemphill St., Ft. Worth, Tex.
Tex-Tube Inc., Houston, Tex.
Thompson Wire Co.
41 Mildred Ave., Boston 26, Mass.
Timken Roller Bearing Co.
Timken Steel & Tube Div.
1835 Dueber Ave. S.W., Canton 6, O.
Titanium Alloy Mfg. Div.
National Lead Co.
111 Broadway, New York 6, N. Y.
Toledo Steel Tube Co.
2105 Smead Ave., Toledo 6, Ohio
Tonawanda Iron Div.
American Radiator & Standard Sanitary Corp., North Tonawanda, N. Y.
Townsend Co., New Brighton, Pa.
Tredegar Co., Richmond, Va.
Trent Tube Co. Subsidiary of Crucible Steel Co. of America
498 S. Church St., East Troy, Wis.
Tube Reducing Corp. Subsidiary of American Metal Products Co.
520 Main Ave., Wallington, N. J.
Tubeco Inc., Minneapolis, Minn.
Tubecraft
2920 Columbia St., Torrance, Calif.

Ulbrich Stainless Steels Inc.
Wallingford, Conn.
Union Carbide Metals Co.
Div. of Union Carbide Corp.
30 E. 42nd St., New York 17, N. Y.
Union Electric Steel Corp.
2344 Oliver Bldg., Pittsburgh 22, Pa.
Union Steel Corp.
1550 Ashwood Terrace, Union, N. J.
Union Wire Rope Corp.
Subsidiary of Armco Steel Corp.
21st & Manchester Ave.
Kansas City 26, Mo.
United States Pipe & Foundry Co.
3300 First Ave. N.
Birmingham 2, Ala.
United States Steel Corp.
525 William Penn Place
Pittsburgh 30, Pa.
United Tube Corp. of Ohio
3860 E. 91st St., Cleveland 5, Ohio
Universal-Cyclops Steel Corp.
Bridgeville, Pa.

Valley Mould & Iron Corp.
Hubbard, Ohio
Van Huffel Tube Corp., Warren, Ohio
Vanadium-Alloys Steel Co., Latrobe, Pa.
Vanadium Corp. of America
420 Lexington Ave., New York 17
Virginia-Carolina Chemical Corp.
401 E. Main St., Richmond 19, Va.
Vulcan-Kidd Steel Div.
H. K. Porter Company Inc.
West Aliquippa, Pa.

Wallace Barnes Co.
Div. of Associated Spring Corp.
Bristol, Conn.
Wallingford Steel Co.
Subsidiary of Allegheny Ludlum Steel Corp., Wallingford, Conn.
Washburn Wire Co.
Phillipsdale 16, R. I.
Washington Steel Corp.
Griffith & Woodland Ave.
Washington, Pa.
Weirton Steel Div., National Steel Corp.
Weirton, W. Va.
Welded Tubes Inc., Orwell, Ohio
Wesco Steel Rolling Mills Corp.
P.O. Box 31, Bell, Calif.
Western Automatic Machine Screw Co.
Cold Drawn Steel Plant
Div. of Standard Screw Co.
Elyria, Ohio
Wheatland Tube Co.
1300 Bankers Securities Bldg.
Philadelphia 7, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Wickwire Bros. Inc.
189 Main St., Cortland, N. Y.
Williams Mfg. Co., Ft. Smith, Ark.
Wilson Steel & Wire Co.
4840 S. Western Ave., Chicago 9, Ill.
Wire Sales Co.
4630 W. 54th St., Chicago 32, Ill.
Woodward Iron Co., Woodward, Ala.
Wright Steel & Wire Co., G. F.
243 Stafford St., Worcester 3, Mass.
Wyckoff Steel Co.
603 Stanwix St., Pittsburgh 22, Pa.

Youngstown Sheet & Tube Co.
7655 Market St., Youngstown 1, Ohio

Pig Iron

CAPACITY of U. S. blast furnaces climbed 11.2 per cent in the three years ended Jan. 1, 1960, yet only one furnace had been added. The gain of 9,702,680 net tons came from an increase in the size of furnaces when they were rebuilt or replaced and improved operating technology—a trend that also characterized the three years prior to Jan. 1, 1957.

Blast furnace capacity kept pace with steelmaking capacity. On Jan. 1, 1960, blast furnace capacity was 71.9 per cent of open hearth, bessemer, and basic oxygen steelmaking capacity compared with 71.5 per cent of the open hearth and bessemer capacity on Jan. 1, 1957.

Blast Furnace Capacity By Companies

	No. of stacks	Total annual capacity (N. T.)
Companies:		
Alan Wood Steel Company	2	544,200
Armco Steel Corporation	6	2,516,000
Sheffield Division	1	540,000
TOTAL	7	3,056,000
Berkman Company, Louis	1	136,800
Bethlehem Steel Company	33	(a) 15,000,000
Colorado Fuel and Iron Corporation	7	1,469,600
Crucible Steel Company of America	3	895,000
Detroit Steel Corporation	2	768,700
Eastern Gas and Fuel Associates	1	195,000
Ford Motor Company	3	1,331,000
Granite City Steel Company	2	792,000
Inland Steel Company	8	3,562,350
Interlake Iron Corporation	7	1,630,000
International Harvester Company	3	808,000
Jackson Iron & Steel Company	1	95,000
Jones & Laughlin Steel Corporation	13	5,061,000
Kaiser Steel Corporation	4	1,997,800
Lavino & Company, E. J.	3	(b) 184,000
Lone Star Steel Company	1	385,000
McLouth Steel Corporation	2	1,359,250
Merritt-Chapman & Scott Corp.:		
Tennessee Products & Chemical Corp.	3	217,740
National Steel Corporation:		
Great Lakes Steel Corporation	4	2,600,000
Hanna Furnace Corporation	4	850,000
Weirton Steel Division	4	2,400,000
TOTAL	12	5,850,000
New Jersey Zinc Company	2	(c) 112,000
Phoenix Steel Corp.	1	200,000
Pittsburgh Coke & Chemical Company	3	836,500
Pittsburgh Steel Company	3	950,000
Republic Steel Corporation	22	8,146,000
Sharon Steel Corporation	3	884,000
Shenango Furnace Company	2	445,450
Tonawanda Iron Division, American Radiator & Stand. Sanitary Corp.	1	165,000
United States Pipe & Foundry Co.	5	900,410
United States Steel Corporation:		
United States Steel Corp. (Central Operations)	51	(d) 21,264,600
American Steel & Wire Division	6	1,855,000
Columbia-Geneva Steel Division	5	1,804,200
National Tube Division	9	3,535,000
Tennessee Coal & Iron Division	9	(e) 3,217,400
TOTAL	80	(f) 31,676,200
Wheeling Steel Corporation	6	1,954,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,140,000
GRAND TOTAL	263	(g) 96,520,630

(a) Includes 240,000 tons ferroalloys capacity.
(b) Ferromanganese only.
(c) Spiegeleisen only.
(d) Includes 302,500 tons ferroalloys capacity.
(e) Includes 39,000 tons ferroalloys capacity.
(f) Includes 341,500 tons ferroalloys capacity.
(g) Includes 877,500 tons ferroalloys capacity.

Blast Furnace Capacity by Plant Location and Operating Company

Plant Location and Operating Company:	No. of stacks	Total annual capacity (N. T.)
Alabama		
Birmingham		
Republic Steel Corporation	2	402,000
United States Pipe & Foundry Co.	2	281,230
Ensley		
Tennessee Coal & Iron Division	6	(a) 1,829,000
Fairfield		
Tennessee Coal & Iron Division	3	1,388,400
Gadsden		
Republic Steel Corporation	2	525,000
North Birmingham		
United States Pipe & Foundry Co.	3	619,180
Woodward		
Woodward Iron Company	4	772,630
TOTAL	22	5,817,440
California		
Fontana		
Kaiser Steel Corporation	4	1,997,800
Colorado		
Pueblo		
Colorado Fuel and Iron Corporation	4	922,400
Illinois		
Chicago		
Interlake Iron Corporation	2	587,000
International Harvester Company	3	808,000
Republic Steel Corporation	1	630,000
United States Steel Corp. (Central Operations)	11	4,454,200
Youngstown Sheet and Tube Company	3	684,000
Granite City		
Granite City Steel Co.	2	792,000
TOTAL	22	7,955,200
Indiana		
East Chicago		
Inland Steel Company	8	3,562,350
Youngstown Sheet and Tube Company	3	1,296,000
Gary		
United States Steel Corp. (Central Operations)	12	5,466,000
TOTAL	23	10,324,350
Kentucky		
Ashland		
Armco Steel Corporation	3	1,058,000
Maryland		
Sparrows Point		
Bethlehem Steel Company	10	5,480,000
Massachusetts		
Everett		
Eastern Gas and Fuel Associates	1	195,000
Michigan		
Dearborn		
Ford Motor Company	3	1,331,000
River Rouge		
Great Lakes Steel Corporation	4	2,600,000
Trenton		
McLouth Steel Corporation	2	1,359,250
TOTAL	9	5,290,250
Minnesota		
Duluth		
American Steel & Wire Division	2	550,000
Interlake Iron Corporation	1	146,000
TOTAL	3	696,000
New York		
Buffalo		
Hanna Furnace Corporation	4	850,000
Republic Steel Corporation	2	683,000
Lackawanna		
Bethlehem Steel Company	7	3,590,000
North Tonawanda		
Tonawanda Iron Division	1	165,000
Tonawanda		
Colorado Fuel & Iron Corporation	2	396,000
Troy		
Republic Steel Corporation	1	263,000
TOTAL	17	5,947,000
Ohio		
Campbell		
Youngstown Sheet and Tube Company	4	1,452,000
Canton		
Republic Steel Corporation	1	266,000
Cleveland		
American Steel & Wire Division	2	805,000
Jones & Laughlin Steel Corporation	2	866,000
Republic Steel Corporation	6	2,708,000
Hubbard		
Youngstown Sheet and Tube Company	1	204,000
Jackson		
Interlake Iron Corporation	1	75,000
Jackson Iron & Steel Company	1	95,000
Lorain		
National Tube Division	5	2,160,000
Lowellville		
Sharon Steel Corporation	1	149,000
Martins Ferry		
Louis Berkman Company	1	136,800
Massillon		
Republic Steel Corporation	1	266,000
Middletown		
Armco Steel Corporation	1	854,000
New Miami		
Armco Steel Corporation	2	604,000
Portsmouth		
Detroit Steel Corporation	2	768,700
Steubenville		
Wheeling Steel Corporation	5	1,708,000
Ohio (Continued)		
Struthers		
Pittsburgh Coke & Chemical Company	1	182,500
Toledo		
Interlake Iron Corporation	2	551,000
Warren		
Republic Steel Corporation	1	630,000
Youngstown		
Republic Steel Corporation	5	1,773,000
United States Steel Corp. (Central Operations)	5	1,976,500
Youngstown Sheet and Tube Company	2	504,000
TOTAL	52	18,734,500
Pennsylvania		
Aliquippa		
Jones & Laughlin Steel Corporation	5	2,090,000
Bethlehem		
Bethlehem Steel Company	7	2,910,000
Birdsboro		
Colorado Fuel and Iron Corporation	1	151,300
Braddock		
United States Steel Corp. (Central Operations)	7	2,963,100
Chester		
Phoenix Steel Corp.	1	200,000
Clairton		
United States Steel Corp. (Central Operations)	1	365,600
Donora		
American Steel & Wire Division	2	500,000
Duquesne		
United States Steel Corp. (Central Operations)	6	(a) 1,497,000
Erie		
Interlake Iron Corporation	1	271,000
Fairless Hills		
United States Steel Corp. (Central Operations)	3	2,039,400
Farrell		
Sharon Steel Corporation	2	735,000
Johnstown		
Bethlehem Steel Company	6	(b) 2,000,000
McKeesport		
National Tube Division	4	1,375,000
Midland		
Crucible Steel Company of America	3	895,000
Monessen		
Pittsburgh Steel Company	3	950,000
Neville Island		
Pittsburgh Coke & Chemical Company	2	654,000
Palmerton		
New Jersey Zinc Company	2	(c) 112,000
Pittsburgh		
Jones & Laughlin Steel Corporation	6	2,105,000
Rankin		
United States Steel Corp. (Central Operations)	6	2,502,800
Sharpsville		
Shenango Furnace Company	2	445,450
Sheridan		
Lavino and Company, E. J.	1	(d) 56,000
Steelton		
Bethlehem Steel Company	3	1,020,000
Swedeland		
Alan Wood Steel Company	2	544,200
TOTAL	76	26,381,750
Tennessee		
Lyles-Wrigley		
Merritt-Chapman & Scott Corp.:		
Tennessee Products & Chemical Corp.	1	36,300
Rockwood		
Merritt-Chapman & Scott Corp.:		
Tennessee Products & Chemical Corp.	2	181,440
TOTAL	3	217,740
Texas		
Houston		
Sheffield Division	1	540,000
Lone Star		
Lone Star Steel Company	1	385,000
TOTAL	2	925,000
Utah		
Geneva		
Columbia-Geneva Steel Division	3	1,321,500
Ironton		
Columbia-Geneva Steel Division	2	482,700
TOTAL	5	1,804,200
Virginia		
Lynchburg		
Lavino and Company, E. J.	2	(a) 128,000
West Virginia		
Benwood		
Wheeling Steel Corporation	1	246,000
Weirton		
Weirton Steel Division	4	2,400,000
TOTAL	5	2,646,000
GRAND TOTAL	263	(b) 96,520,630

(a) Ferromanganese only.
(b) Includes 877,500 tons ferroalloys capacity.

Coke

A DECLINE in the cokemaking capacity of the U. S. iron and steel industry continued in the three years ended Jan. 1, 1960, adding up to 661,280 net tons for that period. In the three years prior to Jan. 1, 1957, capacity declined 268,560 tons. The decline contrasts with a substantial increase in capacity of blast furnaces (coke users). Improved practices have made it possible for blast furnaces to produce more pig iron with less coke. All of the decline was in beehive capacity. Capacity of coal chemical recovery ovens (byproduct) rose moderately.

Coke Capacity by Plant Location and Operating Company

Plant Location and Operating Company	Beehive: No. of ovens	Beehive: Annual capacity (N. T.)	Byproduct: No. of ovens	Byproduct: Annual capacity (N. T.)	Total annual capacity (N. T.)
Alabama					
Birmingham					
Republic Steel Corporation	.....	.....	65	375,000	375,000
Fairfield					
Tennessee Coal & Iron Division	.....	.....	562	3,096,900	3,096,900
Gadsden					
Republic Steel Corporation	.....	.....	102	565,000	565,000
North Birmingham					
United States Pipe & Foundry Co.	.....	.....	240	1,175,000	1,175,000
Woodward					
Woodward Iron Company	.....	.....	256	938,000	938,000
TOTAL	.....	.....	1,225	6,149,900	6,149,900
California					
Fontana					
Kaiser Steel Corporation	.....	.....	315	1,502,000	1,502,000
Colorado					
Pueblo					
Colorado Fuel and Iron Corporation	.....	.....	237	985,500	985,500
Illinois					
Chicago					
Interlake Iron Corporation	.....	.....	100	558,000	558,000
International Harvester Company	.....	.....	155	750,000	750,000
Republic Steel Corporation	.....	.....	75	460,000	460,000
Youngstown Sheet and Tube Co.	.....	.....	78	420,000	420,000
Granite City					
Granite City Steel Company	.....	.....	76	450,000	450,000
TOTAL	.....	.....	476	2,638,000	2,638,000
Indiana					
East Chicago					
Inland Steel Company	.....	.....	531	2,847,000	2,847,000
Youngstown Sheet and Tube Co.	.....	.....	270	1,572,000	1,572,000
Gary					
United States Steel Corp. (Central Operations)	.....	.....	1,162	5,400,000	5,400,000
TOTAL	.....	.....	1,963	9,819,000	9,819,000
Maryland					
Sparrows Point					
Bethlehem Steel Company	.....	.....	758	4,174,000	4,174,000
			1/2		
Massachusetts					
Everett					
*Eastern Gas and Fuel Associates	.....	.....	108	664,000	664,000
Michigan					
Dearborn					
Ford Motor Company	.....	.....	220	1,460,000	1,460,000
River Rouge					
Great Lakes Steel Corporation	.....	.....	294	2,000,000	2,000,000
TOTAL	.....	.....	514	3,460,000	3,460,000
Minnesota					
Duluth					
American Steel & Wire Division	.....	.....	115	583,600	583,600
Interlake Iron Corporation	.....	.....	61	310,000	310,000
TOTAL	.....	.....	176	893,600	893,600
New York					
Buffalo					
†Donner-Hanna Coke Corporation	.....	.....	251	1,115,000	1,115,000
Lackawanna					
Bethlehem Steel Company	.....	.....	459	2,514,000	2,514,000
TOTAL	.....	.....	710	3,629,000	3,629,000
Ohio					
Campbell					
Youngstown Sheet and Tube Co.	.....	.....	381	2,012,000	2,012,000
Cleveland					
American Steel & Wire Division	.....	.....	180	834,500	834,500
Republic Steel Corporation	.....	.....	354	2,085,000	2,085,000
Ohio (Continued)					
Lorain					
National Tube Division	.....	.....	413	1,869,000	1,869,000
Massillon					
Republic Steel Corporation	.....	.....	31	188,000	188,000
Middletown					
Armco Steel Corporation	.....	.....	76	525,000	525,000
New Boston					
Detroit Steel Corporation	.....	.....	108	550,000	550,000
New Miami					
Armco Steel Corporation	.....	.....	110	525,000	525,000
Toledo					
Interlake Iron Corporation	.....	.....	151	518,000	518,000
Warren					
Republic Steel Corporation	.....	.....	141	870,000	870,000
Youngstown					
Republic Steel Corporation	.....	.....	172	1,000,000	1,000,000
Youngstown Sheet & Tube Co.	.....	.....	84	372,000	372,000
TOTAL	.....	.....	2,201	11,348,500	11,348,500
Pennsylvania					
Aliquippa					
Jones & Laughlin Steel Corp.	.....	.....	352	1,935,000	1,935,000
Bethlehem					
Bethlehem Steel Company	.....	.....	496	2,136,000	2,136,000
Brownsville Junction					
Republic Steel Corporation	296	215,000	.....	.....	215,000
Clairton					
United States Steel Corp. (Central Operations)	.....	.....	1,567	7,966,900	7,966,900
Erie					
Interlake Iron Corporation	.....	.....	58	267,000	267,000
Fairless Hills					
United States Steel Corp. (Central Operations)	.....	.....	174	952,100	952,100
Johnstown					
Bethlehem Steel Company	.....	.....	316	1,836,000	1,836,000
Leisenring					
United States Steel Corp. (Central Operations)	499	274,100	.....	.....	274,100
Midland					
Crucible Steel Company of America	.....	.....	213	790,000	790,000
Monessen					
Pittsburgh Steel Company	320	228,000	93	600,000	828,000
Mount Pleasant					
Carpentertown Coal & Coke Co.	277	160,000	.....	.....	160,000
Neville Island					
Pittsburgh Coke & Chemical Co.	.....	.....	105	750,000	750,000
Pittsburgh					
Jones & Laughlin Steel Corporation	.....	.....	318	1,194,000	1,194,000
Steelton					
Bethlehem Steel Company	.....	.....	130	768,000	768,000
Swedeland					
Alan Wood Steel Company	.....	.....	151	600,000	600,000
TOTAL	1,392	877,100	3,973	19,795,000	20,672,100
Tennessee					
Chattanooga					
Merritt-Chapman & Scott Corp.: Tennessee Products & Chemical Corp.	.....	.....	44	251,500	251,500
Texas					
Houston					
Sheffield Division	.....	.....	62	394,000	394,000
Lone Star					
Lone Star Steel Company	.....	.....	78	438,000	438,000
TOTAL	.....	.....	140	832,000	832,000
Utah					
Geneva					
Columbia-Geneva Steel Division	.....	.....	252	1,169,600	1,169,600
Ironton					
Columbia-Geneva Steel Division	.....	.....	56	265,000	265,000
TOTAL	.....	.....	308	1,434,600	1,434,600
West Virginia					
East Steubenville					
Wheeling Steel Corporation	.....	.....	314	1,720,000	1,720,000
Fairmont					
Sharon Steel Corporation	.....	.....	60	236,000	236,000
Weirton					
Weirton Steel Division	.....	.....	294	1,900,000	1,900,000
TOTAL	.....	.....	668	3,856,000	3,856,000
GRAND TOTAL	1,392	877,100	13,816	71,432,600	72,309,700

† Owned jointly by the Hanna Furnace Corporation and Republic Steel Corporation.
* Operations discontinued in 1960.

Canadian Capacities

CANADA's capacities to make steel, pig iron, and coke, and to hot roll steel climbed between 10 and 15 per cent in the three years ended Jan. 1, 1960.

While Canada's over-all capacities to finish steel increased, there were downward adjustments in some products, just as there were in the U. S.

Also as in the U. S., there was a tendency toward fewer but larger furnaces. In the three years, the declines were eight open hearths, and one blast furnace. There were increases of 1 electric furnace, 3 oxygen converters, and 108 coke ovens.

Coke Capacity by U. S. Companies

	BEEHIVE		BYPRODUCT		Total annual capacity (N. T.)
	No. of ovens	Annual capacity (N. T.)	No. of ovens	Annual capacity (N. T.)	
Companies:					
Alan Wood Steel Company	.....	.....	151	600,000	600,000
Armco Steel Corporation	.....	.....	186	1,050,000	1,050,000
Sheffield Division	.....	.....	62	394,000	394,000
TOTAL	.....	.....	248	1,444,000	1,444,000
Bethlehem Steel Company	.....	.....	2,159	11,428,000	11,428,000
Colorado Fuel and Iron Corporation	.....	.....	237	985,500	985,500
Crucible Steel Company of America	.....	.....	213	790,000	790,000
Detroit Steel Corporation	.....	.....	108	550,000	550,000
*Eastern Gas and Fuel Associates	.....	.....	108	664,000	664,000
Ford Motor Company	.....	.....	220	1,460,000	1,460,000
Granite City Steel Company	.....	.....	76	450,000	450,000
Inland Steel Company	.....	.....	531	2,847,000	2,847,000
Interlake Iron Corporation	.....	.....	370	1,653,000	1,653,000
International Harvester Company	.....	.....	155	750,000	750,000
Jones & Laughlin Steel Corporation	.....	.....	670	3,129,000	3,129,000
Kaiser Steel Corporation	.....	.....	315	1,502,000	1,502,000
Lone Star Steel Company	.....	.....	78	438,000	438,000
Merritt-Chapman & Scott Corp.:					
Tennessee Products & Chemical Corp.	.....	.....	44	251,500	251,500
National Steel Corporation:					
Great Lakes Steel Corporation	.....	.....	294	2,000,000	2,000,000
Hanna Furnace Corporation	.....	.....	126	†557,500	†557,500
Weirton Steel Division	.....	.....	294	1,900,000	1,900,000
TOTAL	.....	.....	714	4,457,500	4,457,500
Pittsburgh Coke & Chemical Company	.....	.....	105	750,000	750,000
Pittsburgh Steel Company	320	228,000	93	600,000	828,000
Republic Steel Corporation	296	215,000	1,065	†6,100,500	†6,315,500
Sharon Steel Corporation	.....	.....	60	236,000	236,000
Carpentertown Coal & Coke Co.	277	160,000	.....	.....	160,000
TOTAL	277	160,000	60	236,000	396,000
United States Pipe & Foundry Co.	.....	.....	240	1,175,000	1,175,000
United States Steel Corporation:					
United States Steel Corp. (Central Operations)	499	274,100	2,903	14,319,000	14,593,100
American Steel & Wire Division	.....	.....	295	1,418,100	1,418,100
Columbia-Geneva Steel Division	.....	.....	308	1,434,600	1,434,600
National Tube Division	.....	.....	413	1,869,000	1,869,000
Tennessee Coal & Iron Division	.....	.....	562	3,096,900	3,096,900
TOTAL	499	274,100	4,481	22,137,600	22,411,700
Wheeling Steel Corporation	.....	.....	314	1,720,000	1,720,000
Woodward Iron Company	.....	.....	256	938,000	938,000
Youngstown Sheet and Tube Company	.....	.....	805	4,376,000	4,376,000
GRAND TOTAL	1,392	877,100	13,816	71,432,600	72,309,700

† Includes 50% of coke capacity of the Donner-Hanna Coke Corporation, Buffalo, New York.
*Operations discontinued in 1960.

Steel Ingot Capacity (Canada)

	OPEN HEARTH		OXYGEN		ELECTRIC		Total Annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kinds:							
Open hearth—Basic	27	4,481,000	..	.....	..	.....	4,481,000
Basic Oxygen Process	..	.....	5	1,440,000	..	.....	1,440,000
Electric	..	.....	..	.....	27	778,060	778,060
TOTAL	27	4,481,000	5	1,440,000	27	778,060	6,699,060
Companies:							
Algoma Steel Corporation, Ltd.	6	1,000,000	2	600,000	..	.....	1,600,000
Atlas Steels, Ltd.	..	.....	..	.....	9	170,400	170,400
Burlington Steel Company, Ltd.	..	.....	..	.....	1	26,400	26,400
Crucible Steel of Canada Ltd.	..	.....	..	.....	3	40,000	40,000
Dominion Foundries and Steel Ltd.	..	.....	3	840,000	5	180,400	1,020,400
Dominion Steel & Coal Corp., Ltd.	6	927,000	..	.....	4	123,000	1,050,000
Manitoba Rolling Mill Co.	2	54,000	..	.....	2	65,000	119,000
Premier Steel Mills Ltd.	..	.....	..	.....	2	87,000	87,000
Steel Company of Canada, Ltd.	13	2,500,000	..	.....	..	.....	2,500,000
Western Canada Steel Ltd.:							
Vancouver Rolling Mills, Ltd.	..	.....	..	.....	1	85,860	85,860
TOTAL	27	4,481,000	5	1,440,000	27	778,060	6,699,060
Plant Location and Operating Company:							
Alberta							
Edmonton							
Premier Steel Mills Ltd.	..	.....	..	.....	2	87,000	87,000
British Columbia							
Vancouver							
Western Canada Steel Ltd.:							
Vancouver Rolling Mills, Ltd.	..	.....	..	.....	1	85,860	85,860
Manitoba							
Selkirk							
Manitoba Rolling Mill Co., Ltd.	2	54,000	..	.....	2	65,000	119,000
Nova Scotia							
Sydney							
Dominion Steel & Coal Corp., Ltd.	6	927,000	..	.....	1	33,000	960,000
Ontario							
Hamilton							
Burlington Steel Company, Ltd.	..	.....	..	.....	1	26,400	26,400
Dominion Foundries and Steel Ltd.	..	.....	3	840,000	5	180,400	1,020,400
Steel Company of Canada, Ltd.	13	2,500,000	..	.....	..	.....	2,500,000
Sault Ste. Marie							
Algoma Steel Corporation, Ltd.	6	1,000,000	2	600,000	..	.....	1,600,000
Welland							
Atlas Steels, Ltd.	..	.....	..	.....	9	170,400	170,400
TOTAL — ONTARIO	19	3,500,000	5	1,440,000	15	377,200	5,317,200
Quebec							
Montreal							
Dominion Steel & Coal Corp., Ltd.	..	.....	..	.....	3	90,000	90,000
Sorel							
Crucible Steel of Canada Ltd.	..	.....	..	.....	3	40,000	40,000
TOTAL — QUEBEC	..	.....	..	.....	6	130,000	130,000

Names and Addresses of Canadian Companies

Alberta Phoenix Tube & Pipe Ltd.
75th St. & 68th Ave.,
Edmonton, Alta.

Algoma Steel Corp. Ltd.
Sault Ste. Marie, Ont.

Atlas Steels Ltd.
Welland, Ont.

Barton Tubes Ltd.
Subsidiary of Barton & Sons Ltd.
Burlington, Ont.

Burlington Steel Co. Ltd.
319 Sherman Ave. N.
Hamilton, Ont.

Camrose Tubes Ltd.
100 Church St., Toronto 1, Ont.

Canadian Drawn Steel Co. Ltd.
Gerrard Street, Hamilton, Ont.

Canadian Furnace Co. Ltd.
Subsidiary of Algoma Steel Corp. Ltd.
503 Queen St. E.
Sault Ste. Marie, Ont.

Canadian Western Pipe Mills Ltd.
Port Moody, B. C.

Crucible Steel Co. of Canada Ltd.
Sorel, Que.

Dominion Foundries & Steel Ltd.
Depew Street, Hamilton, Ont.

Dominion Steel & Coal Corp. Ltd.
P.O. Box 249, Montreal, Que.

Electro Metallurgical Co.
Div. of Union Carbide Canada Ltd.
Box 250, Welland, Ont.

Enamel & Heating Products Ltd.
Amherst, N. S.

Exolon Co., Tonawanda, N. Y.
(Works at Thorold, Ont.)

Frost Steel & Wire Co. Ltd.
Subsidiary of Steel Co. of Canada Ltd.
250 Lottridge St., Hamilton, Ont.

Interprovincial Steel Corp. Ltd.
P.O. Box 1670, Regina, Sask.

Lionite Abrasives Ltd.
Subsidiary of General Abrasives Co.
Niagara Falls, Ont.

Manitoba Rolling Mill Co. Ltd.
Subsidiary of Dominion Bridge Co. Ltd.
60 Osborne St., Winnipeg, Man.

Mannesmann Tube Co. Ltd.
Wallace Terrace
Sault Ste. Marie, Ont.

Morrison Steel & Wire Co. Ltd.
Granville Island, Vancouver, B. C.

Page-Hersey Tubes Ltd.
100 Church St., Toronto 1, Ont.

Premier Steel Mills Ltd.
P.O. Box 2348, Edmonton, Alta.

Simonds Canada Abrasive Co. Ltd.
Arvida, Que.

Standard Tube & T. I. Ltd.
Woodstock, Ont.

Stanley Steel Co. Ltd.
Subsidiary of Stanley Works
Hamilton, Ont.

Steel Co. of Canada Ltd.
Wilcox Street, Hamilton, Ont.

Union Drawn Steel Co. Ltd.
Burlington Street E., Hamilton, Ont.

Vanadium-Alloys Steel Canada Ltd.
London, Ont.

Vancouver Rolling Mills Ltd.
Subsidiary of Western Canada Steel Ltd.
450 S. E. Marine Dr.
Vancouver 15, B. C.

Welland Tubes Ltd.
100 Church St., Toronto 1, Ont.

Western Canada Steel Ltd.
450 S. E. Marine Dr.
Vancouver 15, B. C.

Blast Furnace Capacity (Canada)

	Plant Location	No. of stacks	Annual pig iron capacity (N. T.)
Algoma Steel Corporation, Limited	Sault Ste. Marie, Ont.	5	1,583,500
Canadian Furnace Co., Limited	Port Colborne, Ont.	1	190,000
Dominion Foundries and Steel, Limited	Hamilton, Ont.	2	759,000
Dominion Steel & Coal Corporation, Ltd.	Sydney, N. S.	3	684,000
Steel Company of Canada, Limited	Hamilton, Ont.	4	1,450,000
TOTAL		15	4,666,500

Coke Capacity (Canada)

	Plant Location	No. of ovens	Annual capacity (N. T.)
Algoma Steel Corporation, Limited	Sault Ste. Marie, Ont.	253	1,458,000
Dominion Foundries and Steel, Limited	Hamilton, Ont.	105	620,000
Dominion Steel & Coal Corporation, Ltd.	Sydney, N. S.	114	612,000
Hamilton By-Product Coke Ovens, Ltd.*	Hamilton, Ont.	60	180,000
Steel Company of Canada, Limited	Hamilton, Ont.	191	1,151,000
TOTAL		723	4,021,000

Hot Rolled Steel Products Capacity (Canada)

	Annual capacity (N. T.)
Products:	
Rails—Standard, over 60 lbs. per yard	359,000
Rails—60 lbs. or less per yard	9,500
Long Joint or Splice Bars and Tie Plate Bars	86,500
Structural Shapes—Heavy	280,880
Plates—Sheared and Universal	607,300
Hot Rolled Sheets	1,022,400
Coils for Cold Reduced Black Plate and Tin Plate	919,000
Hot Rolled Strip	94,100
Bars—Light Shapes	95,840
Bars—Concrete Reinforcement	341,550
Bars—All Other	672,580
Wire Rods	476,500
Skelp	195,000
Blanks, Tube Rounds or Pierced Billets for Seamless Tubes	150,000
Blooms and Billets for Forging	81,800
GRAND TOTAL	5,391,950
Companies:	
Algoma Steel Corporation, Limited	1,336,000
Atlas Steels, Limited	112,600
Burlington Steel Company, Ltd.	64,000
Crucible Steel of Canada, Limited	33,350
Dominion Foundries and Steel, Limited	840,000
Dominion Steel & Coal Corporation, Ltd.	645,000
Enamel & Heating Products, Ltd.	35,000
Manitoba Rolling Mill Company, Limited	100,000
Premier Steel Mills, Limited	100,000
Steel Company of Canada, Limited	2,140,000
Vanadium-Alloys Steel Canada Limited	11,000
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Ltd	75,000
GRAND TOTAL	5,391,950
Rails—Standard, over 60 lbs. per yard:	
Algoma Steel Corporation, Limited	120,000
Dominion Steel & Coal Corporation, Ltd.	*239,000
GRAND TOTAL	359,000
Rails—60 lbs. or less per yard:	
Algoma Steel Corporation, Limited	9,500
GRAND TOTAL	9,500

* Includes tie plate bars.

	Annual capacity (N. T.)
Long Joint or Splice Bars and Tie Plate Bars:	
Algoma Steel Corporation, Limited	28,500
Dominion Steel & Coal Corporation, Limited	**
Steel Company of Canada, Limited	58,000
GRAND TOTAL	86,500
Structural Shapes—Heavy:	
Algoma Steel Corporation, Limited	192,000
Burlington Steel Company, Limited	1,400
Dominion Steel & Coal Corporation, Ltd.	47,000
Manitoba Rolling Mill Company, Limited	15,980
Premier Steel Mills, Limited	4,000
Steel Company of Canada, Limited	20,500
GRAND TOTAL	280,880
Plates (Sheared and Universal):	
Algoma Steel Corporation, Limited	253,000
Dominion Foundries and Steel, Limited	40,000
Steel Company of Canada, Limited	314,300
GRAND TOTAL	607,300
Hot Rolled Sheets:	
Algoma Steel Corporation, Limited	130,000
Atlas Steels, Limited	9,600
Dominion Foundries and Steel, Limited	120,000
Steel Company of Canada, Limited	762,800
GRAND TOTAL	1,022,400
Coils for Cold Reduced Black Plate and Tin Plate:	
Dominion Foundries and Steel, Limited	660,000
Steel Company of Canada, Limited	259,000
GRAND TOTAL	919,000
Hot Rolled Strip:	
Algoma Steel Corporation, Limited	70,000
Atlas Steels, Limited	9,000
Steel Company of Canada, Limited	15,100
GRAND TOTAL	94,100
Bars—Light Shapes:	
Algoma Steel Corporation, Limited	16,000
Burlington Steel Company, Limited	8,000
Manitoba Rolling Mill Company, Limited	9,740
Premier Steel Mills, Limited	14,000
Steel Company of Canada, Limited	28,100
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Limited	20,000
GRAND TOTAL	95,840

** Included with coils.

	Annual capacity (N. T.)
Bars—Concrete Reinforcement:	
Algoma Steel Corporation, Limited	16,000
Burlington Steel Company, Limited	40,000
Enamel & Heating Products, Limited	35,000
Manitoba Rolling Mill Company, Limited	43,350
Premier Steel Mills, Limited	65,000
Steel Company of Canada, Limited	102,200
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Limited	40,000
GRAND TOTAL	341,550
Bars—All Other:	
Algoma Steel Corporation, Limited	46,000
Atlas Steels, Limited	76,000
Burlington Steel Company, Limited	14,600
Crucible Steel of Canada, Limited	1,650
Dominion Steel & Coal Corporation, Limited	(b) 164,000
Manitoba Rolling Mill Company, Limited	30,930
Premier Steel Mills, Limited	17,000
Steel Company of Canada, Limited	296,400
Vanadium-Alloys Steel Canada, Limited	11,000
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Limited	15,000
GRAND TOTAL	672,580
Wire Rods:	
Atlas Steels, Limited	6,000
Dominion Steel & Coal Corporation, Limited	195,000
Steel Company of Canada, Limited	275,500
GRAND TOTAL	476,500
Skelp:	
Algoma Steel Corporation, Limited	175,000
Dominion Foundries & Steel, Limited	20,000
GRAND TOTAL	195,000
Blanks, Tube Rounds or Pierced Billets for Seamless Tubes:	
Algoma Steel Corporation, Limited	150,000
GRAND TOTAL	150,000
Blooms and Billets for Forging:	
Algoma Steel Corporation, Limited	30,000
Atlas Steels, Limited	12,000
Crucible Steel of Canada, Limited	31,700
Steel Company of Canada, Limited	8,100
GRAND TOTAL	81,800

(b) Includes bars—concrete reinf. and light shapes.

Other Finished Steel Products Capacity (Canada)

	Annual capacity (N. T.)
Products:	
Cold Finished Bars	92,000
Sheets—Cold Rolled	644,000
Sheets—Galvanized	316,000
Strip—Cold Rolled	140,000
Tin Plate—Electrolytic	560,000
Tin and Terne Plate—Hot Dipped	60,000
Splice Bars and Other Rail Joints	56,500
Tie Plates	130,000
Track Spikes	39,000
Wire—Plain	440,700
Wire—Barbed	45,900
Wire—Galvanized	89,700
Wire Nails	120,400
Wire Staples	2,420
Cut Nails	1,800
Woven Wire Fence, Netting and Reinforcing Fabric	99,700
Bale Ties	6,800
Pipe and Tubing:	
Buttweld	283,000
Electricweld	1,297,200
Seamless	275,000
Gasweld	3,000

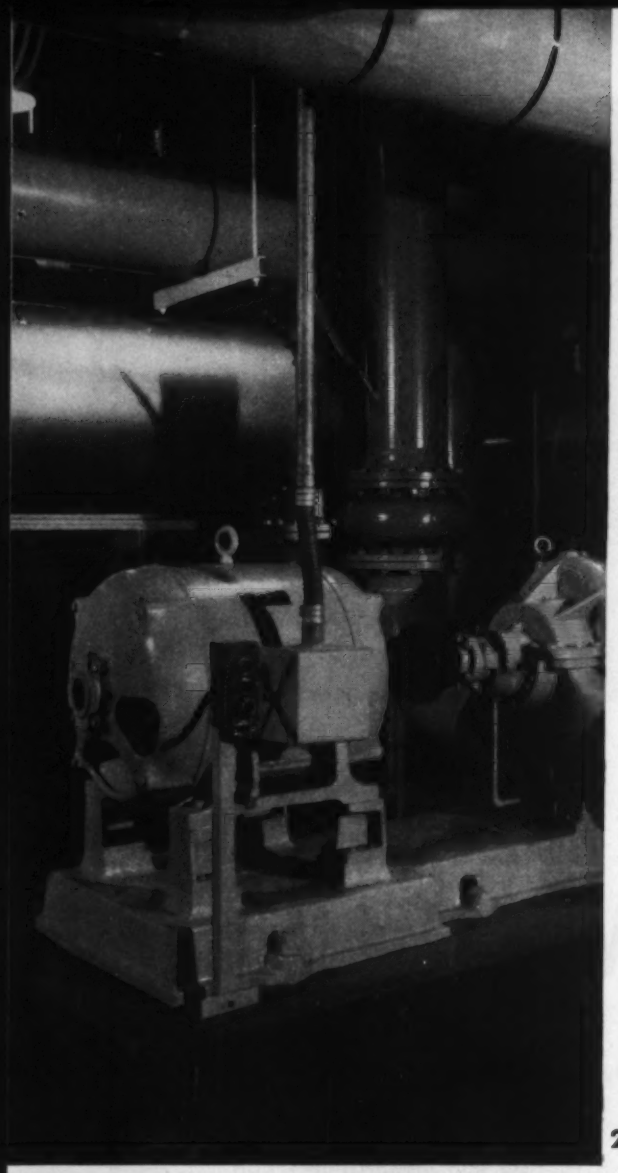
Pipe and Tubing	ANNUAL CAPACITY (N. T.)			
	Buttweld	Seamless	Electric-weld	Gasweld
Companies:				
Alberta Phoenix Tube & Pipe, Limited	....	....	150,000	....
Atlas Steels, Limited	....	....	200	....
Barton Tubes, Limited	....	....	12,000	....
Burlington Steel Company, Limited	....	....	....	3,000
Camrose Tubes, Limited	....	....	250,000	....
Canadian Western Pipe Mills, Limited	....	....	130,000	....
Dominion Steel & Coal Corporation, Limited	30,000	....	....	....
Mannesmann Tube Company, Limited	....	225,000	....	....
Page-Hersey Tubes, Limited	150,000	50,000	415,000	....
Standard Tube & T. I., Limited	....	....	40,000	....
Steel Company of Canada, Limited	103,000	....	....	....
Welland Tubes, Limited	....	....	300,000	....
TOTAL	283,000	275,000	1,297,200	3,000

	Annual capacity (N. T.)
Tin Plate—Hot Dipped:	
Dominion Foundries and Steel, Limited	10,000
Steel Company of Canada, Limited	50,000
GRAND TOTAL	60,000
Tin Plate—Electrolytic:	
Dominion Foundries and Steel, Limited	320,000
Steel Company of Canada, Limited	240,000
GRAND TOTAL	560,000
Wire—Plain, Galvanized and Barbed:	
Atlas Steels, Limited	5,000
Dominion Steel & Coal Corporation, Limited	202,300
Morrison Steel & Wire Company, Limited	15,000
Steel Company of Canada, Limited	354,000
GRAND TOTAL	576,300

	Annual capacity (N. T.)
Wire Products (Nails, Staples, Woven Fence, Netting, Reinforcing Fabric and Bale Ties):	
Dominion Steel & Coal Corporation, Limited	79,900
Morrison Steel & Wire Company, Limited	10,620
Steel Company of Canada, Limited	140,600
GRAND TOTAL	231,120
Cold Finished Bars:	
Atlas Steels, Limited	10,000
Canadian Drawn Steel Company, Limited	40,000
Union Drawn Steel Company, Limited	37,000
Vanadium-Alloys Steel of Canada, Limited	5,000
GRAND TOTAL	92,000
Sheets—Cold Rolled:	
Atlas Steel, Limited	4,000
Dominion Foundries and Steel, Limited	120,000
Steel Company of Canada, Limited	520,000
GRAND TOTAL	644,000

	Annual capacity (N. T.)
Sheets—Galvanized:	
Dominion Foundries and Steel, Limited	120,000
Steel Company of Canada, Limited	196,000
GRAND TOTAL	316,000
Strip—Cold Rolled:	
Algoma Steel Corporation, Limited	80,000
Atlas Steels, Limited	6,000
Dominion Foundries and Steel, Limited	18,000
Stanley Steel Company, Limited	20,000
Steel Company of Canada, Limited	16,000
GRAND TOTAL	140,000
Splice Bars, Rail Joints, Tie Plates and Track Spikes:	
Algoma Steel Corporation, Limited	28,500
Dominion Steel & Coal Corporation, Limited	8,000
Steel Company of Canada, Limited	189,000
GRAND TOTAL	225,500

1.



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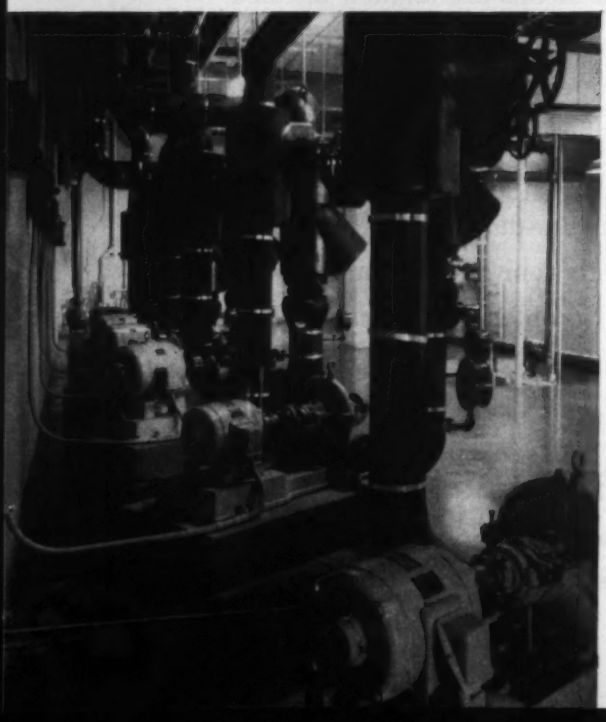

3.

CENTURY MOTORS ARE RIGHT FOR ANY PUMPING JOB

There is a service-proved Century motor for almost every industrial pump application — for centrifugal pumps, condensate pumps, chilled water pumps, reciprocating pumps and many more. Dependable Century motors have been performing outstanding pumping service for years in industrial plants, on farms, in power plants, in heating and air-conditioning units, and on hundreds of other demanding pumping applications.

Century motors have the precise speed regulation important in pumping. And they are exceptionally well protected against dirt, dust, and the severe moisture conditions frequently found in most pump applications.

Century standard squirrel cage motors are shown on this page on typical pump applications at Exchange Park, Dallas, Texas' completely air-conditioned "City within a City".

1. **Duplex condensate pumps driven by two Century squirrel-cage 5-horsepower motors. Pumps are in a pit where dust and dirt make motor ruggedness important.**
2. **Century 75-horsepower squirrel-cage motor drives a condensate water pump.**
3. **Six chilled water pumps driven by a series of two Century 5-horsepower motors, two 15-horsepower motors and two 20-horsepower motors are in the power plant of this large commercial development site.**

Century motors on these three pump applications have been operating for years without service or maintenance problems — proof of Century motor dependability.

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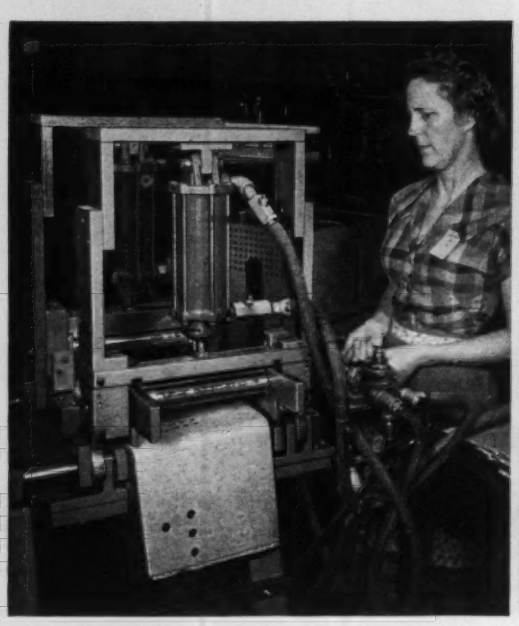

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16 B

Mills to Extend July 4 Cutbacks

LOOK FOR longer than usual shutdowns in the wake of the July 4th holiday. Since orders for steel are still trailing shipments, producers won't be in any hurry to resume melting operations—even on a limited scale. They'll give demand a chance to catch up with supply.

Normally, the upcoming holiday would simply be a long weekend—starting at midnight on Friday, July 1 (when rolling and finishing operations would be suspended) and ending at midnight on Monday, July 4. Steelmakers would tap their open hearths on Sunday but would not charge them again until early Tuesday. Four of 21 turns would be lost, or about 20 per cent of the week's production.

This year, because demand is poor and mill inventories of finished steel are high, the shutdowns will be extended. Some steelmakers will keep their furnaces idle through July 10. Others won't resume production until mid-month. Mills down for vacations or repairs will stay down.

IMPACT ON PRODUCTION— Last week, steelmakers operated their furnaces at 61 per cent of capacity, down 1.3 points from the previous week's revised rate. Output was about 1,739,000 ingot tons. This week, you can expect the ingot rate to drop again. Next week, it may hit bottom for the year: 50 per cent or even lower. Look for July operations to average about 55 per cent of capacity (vs. 61 per cent in June, 70 in May, 80.1 in April, and 91.6 in March.). July production will be about 6.7 million ingot tons.

NOTABLE EXCEPTIONS— Oddly enough, some mills that normally shut down for two weeks in July aren't going to do it this year. They're going to continue working—not because of an upturn in demand for their products, but because they fear that a shutdown would cost them sales. Staggering vacations may not be as economical as closing all departments simultaneously, but staying open may generate enough extra business to offset the higher costs. More important, it may prevent losing valued customers.

SPOTTY DEMAND— At best, the trend in steel orders is sidewise—stabilized at what sales executives hope is the bottom. Demand is spotty because of widespread vacations in consuming industries and the continuing emphasis on inventory liquidation. July will probably be the worst month of the year for production and shipments, but order entry may be as large as June's. Automakers are expected to book sizable tonnage toward the end of the month for September delivery. Although most steelmakers expect no sustained improvement until August, some companies predict an upturn in July.

STAINLESS TO RECOVER— Once hopeful that their shipments would break records this year, stainless producers have lost much of their exuberance. When purchasing agents decided to trim their steel inventories, they slashed stainless stocks first because liquidation of a few tons means a big reduction in dollars. During the second quarter, mill shipments fell to an estimated 140,000 tons—27 per cent below the first quarter's 193,000. In May and June, leading producers shipped at only 60 per cent of capacity. Hopes for an upturn in July are based on the assumption that automakers will want big tonnages of Type 430 trim stock for their 1961 models. Market analysts look for third quarter shipments of 145,000 tons and a fourth quarter outturn of 155,000. Total for the year; 633,000 tons (vs 615,000 in 1959).

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*Current prices were published in the June 20 issue and will appear in subsequent issues.

WHAT HAPPENS WHEN A NATION SPENDS MORE ON GAMBLING THAN IT SPENDS FOR HIGHER EDUCATION?

If you can find any Romans around, ask them. They lived pretty high on the hog in their day. That is, until some serious-minded neighbors from up North moved in. The rest is ancient history.

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Yet today we Americans spend twenty billion dollars a year for legalized gambling, while we spend a niggardly four-and-a-half billion for higher education. Think of it! Over four times as much! We also spend six-and-a-half billion dollars a year for tobacco, nine billion dollars for alcoholic beverages, and billions more on other non-essentials.

Can't we read the handwriting on the wall?

Our very survival depends on the ability of our colleges and universities to continue to turn out thinking men and women. Yet today many of these fine institutions are hard put to make ends meet. Faculty salaries, generally, are so low that qualified teachers are leaving the campus in alarming numbers for better-paying jobs elsewhere.

In the face of this frightening trend, experts estimate that by 1970 college applications will have doubled.

If we are to keep our place among the leading nations of the world, we must do something about this grim situation before it is too late. The tuition usually paid by a college student covers less than half the actual cost of his education. The balance must somehow be made up by the institution. To meet this deficit even the most heavily endowed colleges and universities have to depend upon the generosity of alumni and public spirited citizens. In other words, they depend upon *you*.

For the sake of our country and our children, won't you do your part? Support the college of your choice *today*. Help it to prepare to meet the challenge of tomorrow. The rewards will be greater than you think.

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Merchant Iron Shipments by Grades

(Net tons)

Grades	1957	1958	1959
Low phos, intermediate low phos, bessemer	695,773	409,328	526,688
Basic	1,372,873	513,809	912,407
Malleable, silvery	2,857,906	1,954,327	2,607,339
Foundry	1,641,121	1,201,791	1,341,572
Totals	6,567,673	4,079,255	5,398,006

Shipments of Merchant Pig Iron

(Net tons)

1949	5,815,510
1950	7,476,021
1951	7,561,836
1952	7,206,806
1953	6,839,588
1954	4,924,676
1955	7,553,223
1956	7,893,335
1957	6,567,673
1958	4,079,255
1959	5,398,006
1960 (3 months)	1,277,282

Foundry Needs Set the Pace

SHIPMENTS of merchant pig iron this year are expected to fall below the ten year (1950-59) annual average of 6.5 million net tons, but they're likely to equal or better the 5.4 million tons moved last year. That's the view of foundrymen and ironmakers despite recent spotty foundry operations and curtailed blast furnace activity.

Merchant iron accounts for 9 to 10 per cent of total blast furnace iron production (60.3 million tons in 1959). There are 11 strictly merchant producers, several being divisions of firms manufacturing such finished products as cast iron pipe and plumbing goods. These merchant companies have 35 blast furnaces with annual capacity of 6,208,730 net tons, including ferromanganese and spiegeleisen.

In addition, merchant iron consumers are supplied by many integrated steelmakers who sell a substantial portion of their iron production in the open market. Except under the most unusual demand conditions, supplies of merchant iron have been more than adequate in recent years. Today, there's little stockpiling by consumers. Reason: They're certain of prompt deliveries.

• The bulk of the merchant iron is taken by the nation's 2500 foundries, a small percentage going to steel plants, and a little being exported.

Of the total merchant tonnage, 17 per cent is basic iron, 10 per cent is low phos, low phos intermediate, and bessemer grades, 49 per cent is silvery and malleable grades, and 24 per cent is foundry grade (see table for yearly comparisons by grades).

The foundry business has been following the trend in steelmaking this year. Peak activity was hit in March, and since then the trend has been down. It looks as though the third quarter will be slow, followed by a pickup in the last three months of the year.

A poll of foundrymen by STEEL's sister publication, *Foundry*, indicates conditions in the foundry field are a lot better than current reports would lead one to surmise. About 60 per cent of those queried said 1960 business has been as good as, or better than, expected. More than 80 per cent think the second half year record will at least match first half year production. More than 50 per cent anticipate increased business next year, 23 per cent think 1961 business will be a standoff with that this year, only 4 per cent look for a decrease, while the remainder have no opinion.

The contraction in foundry raw material requirements has naturally adversely affected blast furnace operations. Iron stocks are so heavy, a number of stacks have suspended. More shutdowns are in prospect. Out of 258 blast furnaces in this country, only 203 were operating in May vs. 230 the year before. The curtailment largely reflects the contraction in steelmaking, of course, but a number of furnaces serving the merchant market have suspended.

• Contributing to merchant iron marketing troubles is the increasing availability of good quality scrap at favorable prices.

Usually, the foundry melt runs 50-50 pig iron and scrap. But declining scrap prices (as has been the case for some months past) incline many foundries, particularly the large shops, to increase their scrap charge at the expense of pig iron.

Over the last decade, the average

price of pig iron increased 42.5 per cent, rising from $46.78 a ton in 1950 to $66.58 at the end of 1959, says the Interlake Iron Corp., Cleveland, a large merchant iron producer. In the same period, STEEL's records show cast scrap rose less than 9 per cent, going up $4.15 a gross ton, from an average of $47.69 in 1950 to an average of $51.84 in 1959. From a simple price angle, cast scrap has a current advantage of $24 a ton over No. 2 foundry pig.

Merchant iron sellers also face stiff competition from foreign iron. Imports in 1959 more than tripled to 700,000 tons from 200,000 in 1958. The increase was partly due to steel strike hedging. Imports have declined since the end of the strike.

Imported iron prices on the West Coast range $10 to $20 a ton under the domestic market. On the East Coast, imports are not heavy; quoted prices are around $5 a ton, delivered consumer's plant, below the recognized home market level. Iron from South Africa has been offered recently in Texas at $15 a ton under the domestic price, but without attracting much interest from consumers.

• Merchant iron producers don't think their competitive position, with respect to imports, is as critical as is that of the steelmakers.

Foreign blast furnaces have lower labor rates, but they face high shipping costs in getting iron to this country. Furthermore, if anticipated domestic productivity gains are achieved, foreign price competition should be pretty well minimized, say producers. It's pointed out that the domestic industry is pushing modernization of plants, facilities, and processes, the blast furnace process today being closer to complete automation than most processes in the iron and steel industry.

A significant merchant iron trade development was the recent closing of the Mystic blast furnace at Everett, Mass. About 270 New England consumers have had to find new supply sources. Troy, N. Y. (where merchant iron is produced in substantial quantity), becomes the price basing point for iron delivered into New England when liquidation of furnace iron stocks at Everett is completed.

To narrow freight absorption, lower commodity rates have been established on shipments from Beacon, N. Y., where two Buffalo area ironmakers will stockpile iron for shipment to most New England consuming points. Some adjustment has been made in the rates from Troy.

Blast Furnace Production Declines During May

Blast furnace production (pig iron and ferroalloys) in May totaled 6,394,411 net tons, reports the American Iron & Steel Institute. That compares with 6,830,093 tons in April.

Of total production in May, 63,419 tons were ferromanganese and spiegeleisen, against 69,864 tons in April.

Production in the first five months this year totaled 36,264,736 tons, of which 360,875 tons were ferromanganese and spiegeleisen. In the like period of 1959, output amounted to 35,103,720 tons, of which 260,608 tons were ferromanganese and spiegeleisen. The

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breakdown of production by states follows:

Blast Furnace Production—May, 1960

(Net tons)

States:	May Output	First Five Months 1960	1959
Massachusetts, New York	398,832	2,414,192	2,195,129
Pennsylvania	1,667,141	9,719,410	9,188,441
Maryland, Virginia, W. Virginia	597,276	3,224,443	3,021,690
Kentucky, Tennessee, Texas	158,957	843,202	773,574
Alabama	313,174	1,818,540	2,009,535
Ohio	1,118,493	6,796,537	6,659,369
Indiana	869,970	4,261,735	4,130,939
Illinois	455,349	3,046,962	2,265,569
Michigan, Minnesota	499,576	2,369,952	2,256,473
Colorado, Utah, California	315,643	1,769,763	1,903,001
Totals	6,394,411*	36,264,736†	35,103,720‡

*Includes 63,419 tons of ferromanganese and spiegeleisen.
†Includes 360,875 tons of ferromanganese and spiegeleisen.
‡Includes 260,608 tons of ferromanganese and spiegeleisen.
Data from American Iron & Steel Institute.

American Iron Ore Group Names Jackson Chairman

American Iron Ore Association elected these officers, all of Cleveland: Chairman, H. C. Jackson, Pickands Mather & Co.; president and secretary, Hugo E. Johnson, association staff; vice presidents, W. A. Sterling, Cleveland-Cliffs Iron Co., and E. W. Sloan Jr., Oglebay Norton Co.; treasurer, A. B. Rathbone, Oglebay Norton; assistant treasurer, G. E. Guthery, Oglebay Norton; and controller, Mrs. Hazel M. Ronk, association staff.

Pig Iron . . .

Pig Iron Prices, Page 136

Demand for merchant pig iron remains dull. It is expected to reach the low point early in July and to improve only slightly through the remainder of that month and August. Foundries probably won't buy substantial tonnages until after the summer vacation shutdowns.

Considerable iron is due to move from Buffalo to the upper lake ports and into the New England area this summer.

In an apparent effort to work off stocks on hand since it closed down indefinitely a few weeks ago, the Chester, Pa., furnace (annual capacity, 200,000 tons) of the Phoenix Steel Corp. is offering iron in the merchant trade. Prices are said to be competitive with foreign offerings which are at least $5 a ton below the domestic market.

Chester stocks are reportedly around 30,000 tons. Under a normally active market, this amount would not be too impressive. With conditions dull as they are, it is attracting more than passing attention in the trade.

Reduced rail rates have been posted on shipments from Chester to five nearby points: $1.50 to Philadelphia; $1.80 to Camden, N. J.; $2.75 to Williamstown, N. J.; and $2.90 to Bridgetown, N. J., and Millville, N. J. These apply to car lots of 50 gross tons.

Reduced rail rates are reported at several other market centers, including rates on shipments from Jackson, Ohio, Youngstown, Farrel, Pa., Sharon, Pa., Sharpsville, Pa., Buffalo, Cleveland, Troy, N. Y., Chicago, and Peoria, Ill. Some rates became effective June 3 and June 10, and others were scheduled for

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June 25 and June 29. The reductions are reportedly made to meet truck and lake vessel competition.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 132 & 133

Sheet business is coasting. Demand is spotty, buyers emphasizing inventory liquidation in anticipation of widespread vacation suspensions in the month ahead. One Pittsburgh mill sales official says order entries are running far behind those a month ago.

Still another says: "We know July will be lousy, but we didn't think June would be as bad as it is. We had a nice order placement in May for future delivery, but now we're way off the pace. Order intake has dropped sharply in the last two weeks. It doesn't look like we'll book as much tonnage this month as we did in May. We certainly won't ship as much."

Although some automakers have requested that part of their July tonnage be held up for August delivery, setbacks are unusual. In most cases, the motorcar builders are taking deliveries as originally scheduled.

At most mills, it's believed that July will be the worst month of the year. Production and shipments will almost certainly hit lows, but there's a chance that order entry will be as large as June's. Automakers are expected to book sizable orders toward the end of the month for September delivery.

While most sheetmakers expect no sustained upturn in demand until August, a vocal minority forecasts a rally in July. "The way inventories are being depleted, I expect improvement momentarily," one optimistic sales official declares.

With demand at high level, most producers of galvanized sheets are maintaining full production. The market is firm, but sales executives are on the offensive.

Steel Bars . . .

Bar Prices, Page 131

Hot rolled carbon bar business continues to coast, with the low point for new orders likely to be reached early next month. Consumers are still drawing on inventories for a portion of their requirements.

Deliveries range three to four weeks, but, in some cases, shipments will soon become more extended due to suspensions of production facilities for mass vacations.

Cold finished bars are moving slowly, with tonnage available for early delivery.

Tin Plate . . .

Tin Plate Prices, Page 133

Schedules for tin mill products have been revised by U. S. Steel Corp. They're designed to make the items more competitive with other materials, and they also anticipate the success of thinner tin plate. Net effect of the changes: A reduction in prices of about 4 per cent on some of the lowest basis weight items.

The changes call for lighter basis weights in widths ranging from 29 to 37 in. Similar changes are made in the width table for holloware enameling black plate. Basis weight revisions are:

Basis weight	New Deduction Per Base Box	Old Deduction Per Base Box
70 lb plate	$0.90	$0.85
65 lb plate	1.05	0.95
60 lb plate	1.20	1.05
55 lb plate	1.35	1.15

New width deductions are:

Width	70 lb and Lighter	75 & 80 lb and Lighter	85 lb
Over 29 to 33½ in.	$0.15	$0.15	$0.15
Over 33½ to 36 in.	....	0.15	0.15
Over 36 to 37½ in.	....	....	0.15

In holloware enameling stock, a deduction of 15 cents per 100 lb was made in all widths from over 29 to 37 in. inclusive. The former deduction was 10 cents per 100 lb on widths over 29 to 31 in. inclusive and 15 cents on widths over 31 to 36 in. inclusive.

Other leading producers, including Bethlehem Steel Co. and Republic Steel Corp., are taking similar action.

In comparison with some other products, tin plate continues to make an excellent showing. But some producers are disappointed. They say demand is below expectations because of severe frost damage to peas and other crops.

Changes in extras are viewed by some observers as a move in the battle with aluminum for markets.

Consumption of tin plate in the Far West is expected to equal last year's volume, although ordering from the mills may be off because of more-than-usual dependence on inventories. Sixty packing plants in Northern California are closed by a strike of about 10,000 cannery workers. At the height of the peach canning season, the industry normally employs up to eight times as many workers as are on strike.

Shipments of Steel Products—April, 1960

(Net tons)

Products	Carbon	Alloy	Stainless	First Four Months 1960	First Four Months 1959
Ingots	15,586	9,543	1,868	159,793	104,066
Blooms, slabs, etc.	83,025	35,506	1,456	697,770	601,966
Tube rounds	1,370	442	9	8,875	6,415
Skelp	9,137	.....	....	66,750	17,758
Wire rods	77,054	2,948	680	444,471	477,491
Structurals (heavy)	470,035	7,537	2	2,113,705	1,754,962
Steel piling	39,397	.....	....	160,104	138,151
Plates	566,804	54,371	2,968	2,866,939	2,412,330
Rails (standard)	85,588	.....	....	345,459	300,839
Rails (all other)	3,929	532	....	20,761	17,062
Joint bars	3,634	.....	....	12,506	13,982
Tie plates	15,009	.....	....	59,136	68,355
Track spikes	5,591	.....	....	19,332	21,260
Wheels	22,310	96	....	99,857	79,800
Axles	11,444	24	....	51,605	36,476
Bars—hot rolled	545,074	130,371	3,935	3,278,632	2,949,651
Bars—reinforcing	162,038	.....	....	633,312	765,737
Bars—cold finished	117,119	21,698	4,351	657,439	586,792
Tool steel	1,038	7,060	....	38,307	36,325
Standard pipe	159,235	310	....	921,938	896,533
Oil country goods	84,868	23,261	....	598,945	919,392
Line pipe	245,740	5	....	1,001,189	1,189,301
Mechanical tubing	52,273	19,630	357	354,829	318,571
Pressure tubing	19,383	3,412	1,277	98,930	104,235
Drawn wire	194,257	3,847	1,907	989,456	1,044,922
Nails & staples	22,662	.....	....	127,600	149,932
Barbed wire	5,234	.....	....	18,395	23,207
Woven fence	12,858	.....	....	45,906	68,859
Bale ties, etc.	6,346	.....	....	17,829	25,087
Black plate	50,765	.....	....	226,082	254,515
Tin & terne plate	37,106	.....	....	137,068	156,518
Electro tin plate	470,716	.....	....	1,945,256	2,147,241
Sheets—hot rolled	772,999	20,497	2,561	3,644,971	3,298,399
Sheets—cold rolled	1,363,513	4,487	11,184	6,027,933	5,743,976
Sheets—galvanized	295,453	174	....	1,237,634	1,207,151
Sheets—other coated	27,995	.....	....	108,497	107,969
Elec. Sheets—strip	2,719	45,270	....	254,183	251,976
Strip—hot rolled	132,660	1,881	248	605,074	546,588
Strip—cold rolled	110,162	1,353	12,625	600,721	506,660
Total (1960)	6,302,126	394,255	45,428	30,697,189	.....
Total (1959)	7,968,249	560,853	73,424	.....	29,450,450

Data from American Iron & Steel Institute.

Structurals Lead Imports At Port of Chicago

Basic steel imports into the port of Chicago via the St. Lawrence Seaway during late April and May amounted to 19,429 net tons, reports the Chicago Association of Commerce & Industry. Structural items made up 26.2 per cent of the total, bars 15.2 per cent, plates 0.9 per cent, sheets 6.8, wire and wire products 9.0, tubing and pipe 3.0, wire rods 38.4, barbed wire 0.2, and rails 0.3 per cent.

Almost 77 per cent of the imports were shipped from Antwerp, Belgium. Rotterdam, The Netherlands, accounted for 7.9 per cent; Avonmouth, England, 3.3 per cent; Hamburg, Germany, 3.2; Genoa, Italy, 2.9; Manchester, England, 1.6; Bremen, Germany, and Le-Havre, France, each 1.3; amounts under 1 per cent each came from Liverpool, England; London; Gothenburg, Sweden; and Marseilles, France.

Rails, Cars . . .

Track Material Prices, Page 134

Freight car buying declined in May. Orders totaled 2234 units vs. 5551 in April, reports the American Railway Car Institute and the Association of American Railroads. The May, 1959, total was 5203 cars.

Deliveries in May amounted to 5931 cars vs. 5579 this April and 3358 in May last year.

Backlogs as of June 1 totaled 17,714 cars in railroad shops and 18,392 in commercial shops. Total: 36,106. That compares with 41,003 on order May 1 and 36,869 on June 1 last year.

Structural Shapes . . .

Structural Shape Prices, Page 131

Demand for structurals is spotty and generally disappointing to fabricators who continue to cut into their backlogs. Wide flange beams are reported in stronger demand than plates, but plates are more active than standard structurals.

About the best that can be said for the heavy steel products: They are being consumed at a faster rate than they are being produced. Still, inventories continue fairly high. Both standard and wide flange sections are available for shipment from the mills within three to four weeks.

Most fabricated structural steel estimating in New England is confined to bridge tonnage, and prices are weak. Original shop quotations are frequently shaded. Work on the Prudential Center, Boston, held up by a tax problem, is expected to go ahead.

In the Midwest, demand for structurals has held up better than it has for some other products. Reason: Fairly good activity in the construction and freight car fields. Some fabricators have enough business on their books to operate three or four months. But it's pointed out that current operations are yielding narrow profits because competition has kept bids low.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1000 tons, Nike-Zeus military installation, Marshall Islands (South Pacific), to Leckenby Structural Steel Co., Seattle.

450 tons, welded girder bridge, Hopkinton, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; Munroe & Langstroth Inc., Norwood, Mass., general contractor; 60 tons, concrete reinforcing bars to Bancroft & Martin Rolling Mills Co., South Portland, Maine.

230 tons, 342-ft deck plate girder bridge, Salem, N. H., to A. O. Wilson Structural Co., Cambridge, Mass.; bridge contract sublet to Munroe-Langstroth Inc., Norwood, Mass., by George Brox Inc., Dracut, Mass., general contractor.

220 tons, three-span welded girder bridge, Hopkinton, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; Munroe & Langstroth Inc., Norwood, Mass., general contractor; also, 50 tons of concrete reinforcing bars to Bancroft & Martin Rolling Mills Co., South Portland, Maine; and 45 tons of steel piling to L. B. Foster Co., Boston.

190 tons, state highway bridge, Madison-Clinton, Conn., to Standard Structural Co., Hartford, Conn.; Raymond Construction Co., Hartford, general contractor; 50 tons, concrete reinforcing bars to Scherer Steel Co., East Hartford, Conn.

150 tons, grandstand for Yakima Turf Club, Yakima, Wash., to Leckenby Structural Steel Co., Seattle.

137 tons, bridge FA Route 194, Project U-284(80), Winnebago County, Ill., for State of Illinois, to Vierling Steel Works, Chicago.

110 tons, bridge FAI Route 70, Project I-70-3 (25)89, Effingham County, Ill., for State of Illinois, to Vierling Steel Works, Chicago.

103 tons, bridge, FAI Route 70, Project I-70-3 (26)91, Effingham County, Ill., for State of Illinois, to Vierling Steel Works, Chicago.

STRUCTURAL STEEL PENDING

1393 tons, government furnished, 15.8 mile transmission line, Kittitas County, Wash., involving erection of 73 towers; Brandon Co., Vancouver, Wash., low at $441,970 to Bonneville Power Administration, Portland, Oreg.

1400 tons, arresting gear, Naval Station, Patuxent River, Maryland; Joseph Nebel Co., Washington, low on the general contract.

510 tons, state bridge, Englewood, N. J., Mal-Bros. Contracting Co., West Caldwell, N. J., low on the general contract.

500 tons, store, Sears Roebuck, Huntington, New York; bids asked.

New concept in power feeds

Rockwell announces a new line of Delta 20" Power Feed Drill Presses with a totally different concept: fitting the mechanical control movements of the machine to the natural, easy motion of the operator's hand. This makes possible a simple, low cost method of increasing productivity and improving drilling quality.

Such an advanced development in mechanical power feeds offers advantages *never before available* on a standard drill press—up front control for effortless one hand operation; infinitely adjustable drill point pressure; and a built-in feature for remote control or interlocking with automation devices. Write for free brochure on floor, bench, overhead and multiple-spindle models. Rockwell Manufacturing Company, Delta Power Tool Division, 638F N. Lexington Ave., Pittsburgh 8, Pa.

482 tons, Lake St. Bridge, Elmira, N. Y., Dalrymple Gravel & Contracting Co., Elmira, general contractor.

427 tons, including 135 tons of low alloy, north approach to West highway bridge, Potomac River; bids June 23, U. S. Department of Highways, Washington.

400 tons, 563 ft highway bridge, Wilmette River, Oregon; bids to Salem, Oreg., June 30.

320 tons, Brighton School, Seattle; general contract to Wick Construction Co., Seattle.

300 tons, addition to Providence Hospital, Anchorage, Alaska; Patti-Macdonald Construction Co., Seattle, low at $4,522,800.

288 tons, also 110 tons of reinforcing bars, state highway bridge, Portland, Maine; Frank Rossi & Sons Inc., Gardiner, Maine, general contractor.

275 tons, state highway bridge, Walpole, Mass.; Bayer & Mingolla Construction Co., Worcester, Mass., low on the general contract.

200 tons, replacement of hospital facilities, Seattle-Tacoma Airport; bids to Port of Seattle, June 28.

115 tons, state highway bridge, Bucksport-Orlando, Maine; Forest Frederick, Pittsfield, Maine, general contractor.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2250 tons, department store, Cherry Hill, N. J., for Strawbridge & Clothier, Philadelphia, through Turner Construction Co., Philadelphia, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

1250 tons, American Baptist College, Valley Forge, Pa., through Turner Construction Co., Philadelphia, general contractor, to American Steel Engineering Co., Philadelphia.

260 tons, mental hospital, Anchorage, Alaska, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Lease Co., Seattle, general contractor.

230 tons, five wide flange beam bridges, Waterbury, Vt., Interstate Route 89, Waterbury-Bolton Contract 1, to Joseph T. Ryerson & Son Inc., Boston; Landers & Griffin Inc., Portsmouth, N. H., general contractor; also, 250 tons of steel piles to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, science building, University of Massachusetts, Amherst, Mass., to Scherer Steel Co., East Hartford, Conn.; Joseph Rugo Inc., Boston, general contractor; 70 tons, structural steel, to Groisser & Shlager, Somerville, Mass.

175 tons, three Montana highway bridges, Deer Lodge, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Montana Engineering & Construction Co., general contractor.

150 tons, motor inn, Philadelphia, through Leonard Schaffer Co. Inc., Philadelphia, general contractor, to American Steel Engineering Co., Philadelphia.

100 tons, school projects in Seattle and Bellingham, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

1530 tons, subway under airport runway, Seattle-Tacoma; general contract to Ostruske-Murphy Co. Inc., Tacoma, Wash., by Port of Seattle.

985 tons, Washington State, Vantage Bridge substructure, Columbia River; bids to Olympia, Wash., July 6.

700 tons, two Washington State office buildings; bids to Olympia, Wash., June 24.

500 tons, addition to Washington State Hospital, Sedro-Woolley; project withdrawn for revision and rebid.

380 tons, addition to Virginia Mason Hospital, Seattle; Baugh Construction Co., Seattle, low at $2,152,790.

250 tons, addition to Providence Hospital, Anchorage, Alaska; Patti-MacDonald Construction Co., Seattle, general contractor.

183 tons, including miscellaneous, Crooked River project, Prineville, Oreg.; Pfeiffer & Pontius, Othello, Wash., low at $351,110 to the U. S. Bureau of Reclamation.

130 tons, girder bridge, Grays Harbor County, Washington State; S. S. & Co. Inc., Seattle, low bidder at $307,671 to the Bureau of Public Roads, Portland, Oreg.

100 tons or more, physics-chemistry building, Oregon State College, Corvallis, Oreg.; A. V. Peterson Co., Portland, low bidder at $1,270,890.

100 tons or more, Washington State freeway underpass, Tacoma, Wash.; general contract to Woodworth & Co. Inc., Tacoma, low at $212,269.

PLATES . . .

PLATES PLACED

1349 tons, carbon hull plates (two contracts), Navy, General Stores Supply Office, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.; 172 tons, carbon sheets, to U. S. Steel Export Co., New York.

1008 tons, hull plates, Navy, General Stores Supply Office, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

628 tons, carbon, various sizes and specifications, Ordnance Corps, Raritan Arsenal, Metuchen, N. J., to Phoenix Steel Corp., Phoenixville, Pa.

550 tons, hull plates, Navy, General Stores Supply Office, Philadelphia, to the South Asia Corp., New York; 372 tons, carbon sheets, to Bethlehem Steel Co., Bethlehem, Pa.

233 tons, hull plates, Navy, General Stores Supply Office, Philadelphia, to the Caine Steel Co., Chicago; also, 293 tons of carbon sheets to the same interest.

223 tons, hull plates, Navy, General Stores Supply Office, Philadelphia, to the South Asia Corp., New York.

182 tons, carbon hull plates, Navy, General Stores Supply Office, Philadelphia, to Caine Steel Co., Chicago; also, 231 tons of sheets to Columbia-Geneva Div., U. S. Steel Corp., Washington, D. C.

PLATES PENDING

1581 tons, hull plates, Navy, General Stores Supply Office, Philadelphia; bids July 6.

1400 tons, 54 in. water supply line, Tolt River project, Seattle; general contract to Valley Construction Co. and Morrison-Knudsen Co., joint low at $938,032; pipe subaward pending.

1100 tons, 66 and 72 in. fabricated pipe, Borough of Brooklyn, N. Y.; T. & T. Contracting Co., general contractor.

900 tons, caisson type gate for Puget Sound Navy Yard drydock; Gunderson Bros. Engineering Co., Portland, Oreg., low at $654,853 to the Thirteenth Naval District.

797 tons, stoplogs, lifting frame and guides, Glen Canyon dam, Solo River storage project, Arizona-Utah; bids July 14, U. S. Bureau of Reclamation, Denver.

287 tons, hull, grade HT, Type 1, Navy, General Stores Supply Office, Philadelphia; bids June 28; also, 408 tons of carbon steel sheets.

136 tons, carbon, Navy, General Stores Supply Office, Philadelphia; bids July 1.

125 tons, hull plates, Grade M, Type 11, Navy, General Stores Supply Office, Philadelphia; bids July 5.

100 tons, 500,000 gallon steel watertank; bids to Auburn, Wash., June 21.

Unstated, 150,000 gallon water storage tank, Camp Irwin, Calif.; bids June 27 to the U. S. Engineer, San Francisco.

PIPE . . .

CAST IRON PIPE PLACED

310 tons, 4 to 10 in., two districts, Anchorage, Alaska, to Pacific States Cast Iron Pipe Co., Seattle.

160 tons, 4 to 10 in., Anchorage, Alaska, to U. S. Pipe & Foundry Co., Seattle.

159 tons, 4 to 8 in., for Seattle, to Pacific States Cast Iron Pipe Co., Seattle.

100 tons, including 68 tons of 6 and 12 in. for King County District No. 68, Seattle, to Pacific States Cast Iron Pipe Co., Seattle.

CAST IRON PIPE PENDING

159 tons, 4, 6, and 8 in.; bids in at Seattle.

150 tons, 8 and 10 in.; bids in to Bothell, Wash.

140 tons, 6 and 8 in., District No. 42, Seattle; bids in.

140 tons, 6 to 12 in., two local districts, Seattle; bids in.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago, Milwaukee, St. Paul & Pacific, eight doubledeck cab control and 32 doubledeck trailer suburban coaches, to the Budd Co., Philadelphia; cars will be of stainless steel and will cost about $7 million.

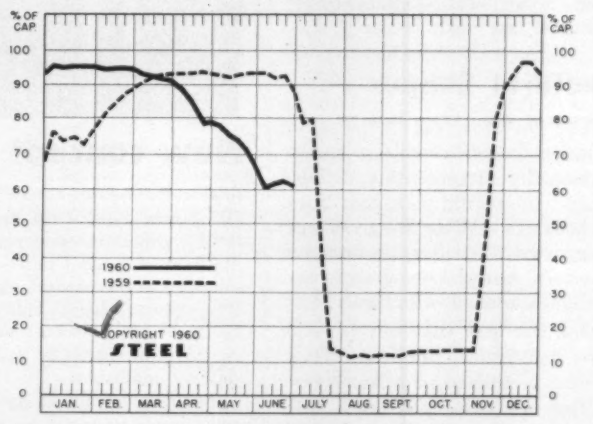
DISTRICT INGOT RATES

(Percentage of capacity utilized)

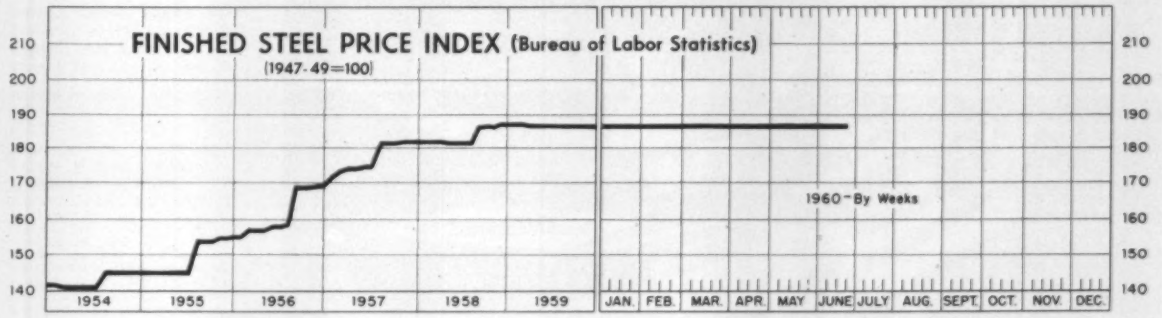
	Week Ended June 26	Month Ago	Week Ago	Year Ago
Northeastern	69	69	72	94
Buffalo	59	60	73	91
Pittsburgh	59	60	70	84
Youngstown	44	42	40	84
Cleveland	58	66	69	91
Detroit	80	82	72	97
Chicago	63	64	72	89
Cincinnati	60	63	52	82
St. Louis	72	74	79	101
Southern	63	65	54	87
Western	63	69	67	90
Total Industry	61.0	62.3	65.6	87.8
Index (1947-49=100)	108.3	110.5	116.4	154.8
Net Tons (In thousands)	1,739	1,775	1,870	2,486

Current week's figures are preliminary. Weekly capacity (net tons): 2,849,306 in 1960 and 2,831,331 in 1959. Source: American Iron & Steel Institute.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



June 21, 1960	Week Ago	Month Ago	May Index	Year Ago
186.6	186.6	186.8	186.8	186.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 21

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H. R. Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.767
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloys, High Speed, W18 Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.585
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	$15.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.647
		Nails, Wire, 8d Common	9.433
		Wire, Barbed (80-rod spool)	8.414
		Woven Wire Fence (20-rod roll)	20.003

STEEL'S FINISHED PRICE INDEX*

	June 22 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	247.82	194.53
Index in cents per lb	6.713	6.713	6.713	6.713	5.270

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.96	$118.45
No. 2 Fdry, Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	31.33	31.33	33.33	36.50	35.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 22 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H. R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	5.85
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, nonstock, Pitts.	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.65	$9.05

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods, 7/32-5/8" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton	June 22 1960	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	55.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.), deld., Cin.	70.20	70.20	70.20	70.20	60.58
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net tons†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$30.50	$30.50	$33.50	$36.50	$34.50
No. 1 Heavy Melt, E. Pa.	34.00	34.00	35.00	38.00	37.25
No. 1 Heavy Melt, Chicago	29.50	29.50	31.50	35.00	34.00
No. 1 Heavy Melt, Valley	32.50	32.50	32.50	39.50	34.50
No. 1 Heavy Melt, Cleve.	31.50	31.50	31.50	36.50	31.50
No. 1 Heavy Melt, Buffalo	30.50	30.50	30.50	33.50	29.50
Rails, Rerolling, Chicago	49.50	49.50	52.50	59.50	51.50
No. 1 Cast, Chicago	40.50	42.50	42.50	52.50	41.50

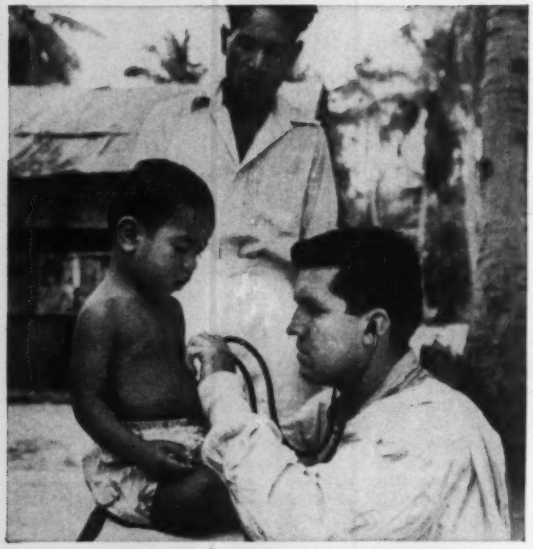
COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.00	$13.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	32.00	25.25

OFFICIAL UNITED STATES NAVY PHOTOGRAPH

This great seaborne health center will carry a new kind of aid abroad—*with your help*. Part of the people-to-people project Hope, it will enlist 200 specialists in sharing our health skills.

Ambassador with a blackboard, the Hope specialist will help the often woefully few local medical technicians train helpers. The result: many more hands. And that means one Hope dollar is multiplied many times over.

YOUR HELP CAN COME BACK A HUNDRED TIMES OVER



One local doctor for 100,000 people. These are the odds Hope may face. Yet Hope can mean so much. The health of this child. The health of five Indonesians. *Trained* hands and only a dollar's worth of penicillin can cure them of crippling yaws.

If enough of us help, the S.S. Hope will be outbound in 1960. First port of call: Indonesia. A bold health project called Hope will be underway.

The need is crucial. Many places, too many health hazards exist. Too many people robbed of the will to live. Too few hands to help. Often, a doctor for 100,000.

Hope's approach is *practical*. Help where a nation's doctors ask help. Help them help themselves to health. By training, upgrade skills—multiply hands. Hope's doctors, dentists, nurses, and technicians will man a center complete to 300-bed mobile unit and portable TV.

You can not only make every dollar do the work of many, you can earn a priceless dividend. With health comes self-respect. People at peace with themselves are less likely to war with others.

Hope is *yours* to give. It's a people-to-people project. For one year's worth, 3½ million Americans must give a dollar. Don't wait to be asked. Mail a dollar or more now to HOPE, Box 9808, Washington 15, D.C.

ADVERTISING COUNCIL PUBLIC SERVICE

HELP LAUNCH HOPE

Steel Prices

Mill prices as reported to STEEL, June 22, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 132, footnotes, page 134.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3 ..104.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ..99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....109.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14 ..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32 ..119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3 ..126.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ....119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ....119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ...122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Benwood,W.Va. W10 ....5.05
Ind.Harbor,Ind. Y1 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1 ..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
Pittsburgh,Calif. C11 ...7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ...5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
Los Angeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14 ..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Sterling,Ill. N15 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 ....7.75
Struthers,O. Y1 ....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05
Sterling,Ill. N15 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ...5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ....5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....14.10

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ...7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2...7.95
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ...7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2...7.50
Youngstown Y1 ....7.50

FLOOR PLATES
Cleveland J5 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ...6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ....5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon
(Merchant Quality)
Ala.City,Ala.(9) R2 ...5.675
Aliquippa,Pa.(9) J5 ...5.675
Alton,Ill. L1 ....5.875
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ...5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P2 ....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ....6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 ....6.375
Owensboro,Ky.(9) G8 ...6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle(9) A24,B3,N15..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11 .6.375
Warren,O. C17 ....6.025
Youngstown(9) R2,U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ...6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14..6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R.
High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ...8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ....5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SIZE ANGLES; S. SHAPES
Wrought Iron
Economy,Pa. B14 ....16.45

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Loaded
(Including loaded extra)
Carbon
LosAngeles P2, S30 ...11.75*

Alloy
Ambridge,Pa. W18 ...10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. F13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.5c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2..7.65
Birmingham C15 ....8.25
Buffalo B5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.85
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
Willimantic,Conn. J5 ...8.15
Youngstown F3, Y1 ....7.85

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. R5 ....9.025
Lackawanna,N.Y. B3 ..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ...9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N.J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025
Warren,O. C17 ....9.025

Waukegan, Ill. A7 ....9.025
Willimantic, Conn. J5 ..9.325
Worcester, Mass. A7 ...9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

Alabama City, Ala. R2 ..5.675
Atlanta A11 .....5.25
Birmingham C15 .....5.25
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse, Mich. G5 .....5.675
Emeryville, Calif. J7 ...6.425
Fairfield, Ala. T2 .....5.675
Fairless, Pa. U5 .....5.825
Fontana, Calif. K1 ....6.375
Ft. Worth, Tex. (26) T4 5.25
Gary, Ind. U5 .....5.675
Houston S5 .....5.925
Ind. Harbor, Ind. I-2, Y1 .5.675
Johnstown, Pa. B2 ....5.675
Joliet, Ill. P22 .....5.675
Kansas City, Mo. S5 ....5.925
Kokomo, Ind. C16 .....5.775
Lackawanna, N.Y. B2 ..5.675
Los Angeles B3 .....6.375
Madison, Ill. L1 .....5.875
Milton, Pa. M18 .....5.825
Minnequa, Colo. C10 ....6.125
Niles, Calif. P1 .....6.375
Pittsburg, Calif. C11 ...6.375
Pittsburgh J5 .....5.675
Portland, Oreg. O4 ....6.425
Sand Springs, Okla. S5 ..5.925
Seattle A24, B3, N14..6.425
S. Chicago, Ill. R2, W14.5.675
S. Duquesne, Pa. U5 ....5.675
S. San Francisco B3 ....6.425
Sparrows Point, Md. B2..5.675
Sterling, Ill. (1) N15 ....5.675
Sterling, Ill. N15 .....5.775
Struthers, O. Y1 .....5.675
Tonawanda, N.Y. B12 ..6.10
Torrance, Calif. C11 ...6.375
Youngstown R2, U5 ...5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown, Pa. B2 .....7.33
Kansas City, Mo. S5.....7.60
Lackawanna, N.Y. B2 ..7.35
Marion, O. P11 .....6.70
Newark, N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
Sand Springs, Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
Sparrows Pt., Md. B2 ....7.33
St. Paul U8 .....8.17
Williamsport, Pa. S19 ...7.25

BARS, Wrought Iron

Economy, Pa. (S.R.) B14 15.10
Economy, Pa. (D.R.) B14 19.30
Econ. (Direct Rolled) B14 13.55
Economy (Staybolt) B14 .19.80
McK. Rks. (S.R.) L5 ....14.50
McK. Rks. (D.R.) L5 ...19.80
McK. Rks. (Staybolt) L5. 20.95

BARS, Rail Steel

Chicago Hts. (3) C2, I-2 .5.575
Chicago Hts. (4) (44) I-2 .5.675
Chicago Hts. (4) C2 ....5.675
Franklin, Pa. (3) F5 ...5.575
Franklin, Pa. (4) F5 ...5.675
Jersey Shore, Pa. (3) J8 ..5.55
Marion, O. (3) P11 ....5.575
Tonawanda (3) B12 ....5.575
Tonawanda (4) B12 .....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Alabama City, Ala. R2 ..5.10
Allenport, Pa. P7 .....5.10
Aliquippa, Pa. J5 .....5.10
Ashland, Ky. (8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken, Pa. A3 ..5.15
Detroit (8) M1 .....5.10
Ecorse, Mich. G5 .....5.10
Fairfield, Ala. T2 .....5.10
Fairless, Pa. U5 .....5.15
Farrell, Pa. S3 .....5.10
Fontana, Calif. K1 ....5.825
Gary, Ind. U5 .....5.10
Geneva, Utah C11 .....5.20
Granite City, Ill. (8) G4 ..5.20
Ind. Harbor, Ind. I-2, Y1.5.10
Irvin, Pa. U5 .....5.10
Lackawanna, N.Y. B2 ..5.10
Mansfield, O. E6 .....5.10
Munhall, Pa. U5 .....5.10
Newport, Ky. A2 .....5.10
Niles, O. M21, S3 .....5.10
Pittsburg, Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth, O. P12 ....5.10
Riverdale, Ill. A1 .....5.10
Sharon, Pa. S3 .....5.10
S. Chicago, Ill. U5, W14 ..5.10
Sparrows Point, Md. B2 ..5.10
Steubenville, O. W10 ....5.10
Warren, O. R2 .....5.10
Weirton, W. Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles, O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary, Ind. U5 .....8.40
Ind. Harbor, Ind. Y1 ....8.40
Irvin, Pa. U5 .....8.40
Munhall, Pa. U5 .....8.40
Newport, Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa, Pa. J5 .....7.525
Ashland, Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken, Pa. A3 ..7.575
Ecorse, Mich. G5 .....7.525
Fairfield, Ala. T2 .....7.525
Fairless, Pa. U5 .....7.575
Farrell, Pa. S3 .....7.525
Fontana, Calif. K1 .....8.25
Gary, Ind. U5 .....7.525
Ind. Harbor, Ind. 1-2, Y1 7.525
Irvin, Pa. U5 .....7.525
Lackawanna (35) B2 ..7.525
Munhall, Pa. U5 .....7.525
Niles, O. S3 .....7.525
Pittsburgh J5 .....7.525
S. Chicago, Ill. U5, W14.7.525
Sharon, Pa. S3 .....7.525
Sparrows Point (36) B2..7.525
Warren, O. R2 .....7.525
Weirton, W. Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland, Ky. (8) A10 ....5.35
Cleveland R2 .....5.875
Warren, O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown, O. A10 ....6.775
Warren, O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Alabama City, Ala. R2 ..6.275
Aliquippa, Pa. J5 .....6.275
Allenport, Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken, Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse, Mich. G5 .....6.275
Fairfield, Ala. T2 .....6.275
Fairless, Pa. U5 .....6.325
Follansbee, W. Va. F4 6.275
Fontana, Calif. K1 .....7.40
Gary, Ind. U5 .....6.275
Granite City, Ill. G4 ....6.375
Ind. Harbor, Ind. I-2, Y1 6.275
Irvin, Pa. U5 .....6.275
Lackawanna, N.Y. B2 ..6.275
Mansfield, O. E6 .....6.275
Middletown, O. A10 ....6.275
Newport, Ky. A2 .....6.275
Pittsburg, Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth, O. P12 ....6.275
Sparrows Point, Md. B2..6.275
Steubenville, O. W10 ...6.275
Warren, O. R2 .....6.275
Weirton, W. Va. W6 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa, Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse, Mich. G5 .....9.275
Fairless, Pa. U5 .....9.325
Fontana, Calif. K1 ....10.40
Gary, Ind. U5 .....9.275
Ind. Harbor, Ind. I-2, Y1 9.275
Lackawanna (38) B2 ..9.275
Pittsburgh J5 .....9.275
Sparrows Point (33) B2..9.275
Warren, O. R2 .....9.275
Weirton, W. Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala. City, Ala. R2	7.225	....
Ashland, Ky. A10	7.225	7.475
Canton, O. R2	7.225	....
Fairfield, Ala. T2	7.225	7.475
Gary, Ind. U5	7.225	7.475
Granite City, Ill. G4	7.325	....
Ind. Harbor I-2	7.225	7.475
Irvin, Pa. U5	7.225	7.475
Kokomo, Ind. C16	7.325	....
Martins Fry. W10	7.225	7.475
Pitts., Calif. C11	7.975	....
Pittsburgh J5	7.225	....
Sparrows Pt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind. Harbor, Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

Alabama City, Ala. R2..6.875‡
Ashland, Ky. A10 ....6.875‡
Canton, O. R2 .....6.875‡
Dover, O. E6 .....6.875†
Fairfield, Ala. T2 .....6.875†
Gary, Ind. U5 .....6.875†
Granite City, Ill. G4 ...6.975*
Ind. Harbor, Ind. I-2 ..6.875†
Irvin, Pa. U5 .....6.875†
Kokomo, Ind. C16 ....6.975‡
Martins Ferry, O. W10..6.875*
Middletown, O. A10 ...6.875†
Pittsburg, Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
Sparrows Pt., Md. B2 ..6.875†
Warren, O. R2 .....6.875†
Weirton, W. Va. W6 ..6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin, Pa. U5 .....10.125
Pittsburgh J5 .....10.125
Sparrows Pt. (39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton, O. R2 .....7.275
Irvin, Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland, Ky. A10 .....7.125
Middletown, O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland (28) R2 .....7.65
Niles, O. (28) R2 .....7.65
Weirton, W. Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Well Casing

Fontana, Calif. K1 ....7.325

SHEETS, Aluminum Coated

Butler, Pa. A10 (type 1) 9.525
Butler, Pa. A10 (type 2) 9.625
Irvin, Pa. U5 (type 1) ..9.525

SHEETS, Enameling

Ashland, Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield, Ala. T2 .....6.775
Gary, Ind. U5 .....6.775
Ind. Harbor, Ind. I-2, Y1 6.775
Irvin, Pa. U5 .....6.775
Middletown, O. A10 ....6.775
Niles, O. M21, S3 .....6.775
Sparrows Point, Md. B2..6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover, O. E6 .....8.70
Ind. Harbor, Ind. I-2 ....8.70
Mansfield, O. E6 .....8.70
Warren, O. R2 .....8.70
Yorkville, O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

Beech Bottom, W. Va. W10 7.225
Gary, Ind. U5 .....7.225
Mansfield, O. E6 .....7.225
Middletown, O. A10 ....7.225
Niles, O. M21, S3 .....7.225
Warren, O. R2 .....7.225
Weirton, W. Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown, O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co., Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N. Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E6 Empire-Reeves Steel
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div. Merritt-Chapman & Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S. & W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Div., Bliss & Laughlin Inc.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J & L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 U. S. Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. W14 ....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3 .8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 .....7.575
Youngstown U5, Y1 ..7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20 .7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. W10 .7.425
Fontana,Calif. K1 ....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ....7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, M22.7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6.7.425
Pawtucket,R.I. R3, N8.7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. S18 .....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ....10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80
Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, M22	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y. R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R., Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ..7.50*
NewCastle,Pa. M22 ..7.425*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1 .7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.825
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, Hot Dipped Common Coke	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary Ind. U5 .....7.85
GraniteCity,Ill. G4 .....7.95
Ind.Harbor,Ind. Y1 .....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$10.05
Irvin,Pa. U5 .....10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles, O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65
Vandergrift,Pa. U5					8.10
Mansfield,O. E6					8.10
Warren,O. R2 (Silicon Lowcore)					8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 ....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 ....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O. (24) S1 ....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ....8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 ....8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 .8.10
Sterling Ill. (1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ....12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ....12.95
Palmer,Mass. W12 .....13.70
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ..13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
Kokomo Ind. C16 .....9.85
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ...9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ..10.05
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ..10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Millbury,Mass.(12) N6..10.05
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ....10.70
Portsmouth O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7,J4,T6 10.05

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ...16.65
Johnstown Pa. B2 ....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C16 ....16.55
Monessen,Pa. P16 ....16.30
Muncie,Ind. I-7 .....16.50
Palmer Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

ROPE WIRE (A)

Bartonville,Ill. K4 .....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 ....13.70
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie Ind. I-7 .....13.65
Palmer,Mass. W12 ....13.75
Portsmouth,O. P12 ....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ..13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 ....13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
Franklin Park,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock Sizes

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb kegs)

Wheeling,W.Va. W10	10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	178
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$8.78
Atlanta A11	10.36
Bartonville,Ill. K4	8.88
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	8.88
Donora,Pa. A7	8.78
Duluth A7	8.78
Fairfield,Ala. T2	8.78
Houston S5	10.51
Jacksonville,Fla. M8	8.88
Johnstown,Pa. B2	8.78
Joliet,Ill. A7	8.78
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	8.88
LosAngeles B3	9.44
Minnequa,Colo. C10	9.49
Pittsburg,Calif. C11	9.44
S.Chicago,Ill. R2	8.78
S.SanFrancisco C10	9.94
SparrowsPt.,Md. B2	8.88
Sterling,Ill.(37) N15	8.88

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.06
Atlanta A11	10.70
Bartonville,Ill. K4	9.16
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.16
Donora,Pa. A7	9.06
Duluth A7	9.06
Fairfield,Ala. T2	9.06
Houston S5	10.85
Jacksonville,Fla. M8	9.16
Johnstown,Pa. B2	9.06
Joliet,Ill. A7	9.06
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.16
LosAngeles B3	9.75
Minnequa,Colo. C10	9.79
Pittsburg,Calif. C11	9.75
S.Chicago,Ill. R2	9.06
S.SanFrancisco C10	10.26
SparrowsPt.,Md. B2	9.16
Sterling,Ill.(37) N15	9.16

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.11
Atlanta A11	10.75
Bartonville,Ill. K4	9.21
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.21
Donora,Pa. A7	9.11
Duluth A7	9.11
Fairfield,Ala. T2	9.11
Houston S5	10.90
Jacksonville,Fla. M8	9.21
Johnstown,Pa. B2	9.11
Joliet,Ill. A7	9.11
KansasCity,Mo. S5	10.96
Kokomo,Ind. C16	9.21
LosAngeles B3	9.80
Minnequa,Colo. C10	9.84
Pittsburg,Calif. C11	9.80
S.Chicago,Ill. R2	9.11
S.SanFrancisco C10	10.31
SparrowsPt.,Md. B2	9.21
Sterling,Ill.(37) N15	9.21

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2.	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	199
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa. 9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	193
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)

	An'ld Galv. Stone	Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.95	19.50†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitt.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	9.10 9.775§
Bartonville(48) K4	9.85 19.90
Buffalo W12	9.00 9.55†
Cleveland A7	9.00
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
KansasCity(48)S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Minnequa C10	9.25 9.80**
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(37)(48)N15	9.10 9.80
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass. A7	9.30 9.85†

Based on zinc prices of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Consumer discounts per cent off list prices, orders for 1 container for assorted sizes; for less than container quantities, add 25 per cent; attaching nuts to bolts, package sizes, add 7.5 per cent; heavy hex nut 1⅛ in. through 1½ in. tapped 8 threads, add 10 per cent)

HEX HEAD CAP SCREWS, coarse or fine thread, packaged or bulk, with or without hex nuts, 1020 steel bright and high carbon heat treated, ¼ in. thru 1 in. diam., listed lengths:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packaged	43.75
Bulk	50

BOLTS, Standard stock sizes:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packaged	43.75
*Bulk	50

*Hot galvanized or zinc plated lag bolts only — for package or bulk quantities use applicable list less bulk discounts.

HEXAGON NUTS, American Standard: Finished hex, hex jam, and hex slotted coarse or fine thread, ¼ in. through 3 in., finished hex thick, thick and slotted, castle, fine thread, ¼ in. through 1½ in., semifinished hex heavy, heavy and jam, heavy and slotted, coarse thread, ¼ in. through 4 in., and

SQUARE NUTS, American Standard: Regular square and heavy square, coarse thread, ¼ in. through 2 in.:

Plain Finish	50
Hot Galvanized and Zinc Plated:	
Packages	43.75
Bulk	50

CAP AND SETSCREWS,

Fillister Head, Cap Screws, Coarse Thread:

Packages	+55
Bulk	+16

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter:

Packages	+85
Bulk	+38

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam, 6 in. and shorter:	
Packages	+5
Bulk	+19
Through 1 in. diam., longer than 6 in.:	
Packages	+29

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85
⅞ in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Buffalo W12	$26.20	$38.50	$47.90	$61.30	$80.30
KansasCity,Mo. U3	26.20	38.50	47.90	61.30	80.30
Minnequa,Colo. C10	26.20	38.50	47.90	61.30	80.30
Pittsburg,Calif. C11	26.20	38.50	47.90	61.30	80.30
Roebling,N.J. R5	26.20	38.50	47.90	61.30	80.30
SparrowsPoint,Md. B2	26.20	38.50	47.90	61.30	80.30
St.Louis L8	26.20	38.50	47.90	61.30	80.30
Waukegan,Ill. A7	26.20	38.50	47.90	61.30	80.30

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	7.025

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

SCREW SPIKES

Lebanon,Pa. B2	15.10

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	15.35
Seattle B3	15.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2, Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.70c; 1 15/16 to 3 in., inclusive, 7.05c.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(12) Worcester, Mass., base.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) 14 Ga., 48 in.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds, 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		⅝		¾		1		1¼	
List Per Ft	5.5c		6c		8.5c		11.5c		17c		23c			
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	2.5	+26	+10.5	+36	+21.5	+46	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.75		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.75	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on price of zinc at 13.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co., Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	49.80	61.35	72.80	84.40	....
Nickel	43.20	55.05	66.95	78.90	....
Nickel, Low Carbon	43.50	55.70	67.95	80.35	....
Monel	44.25	55.35	66.45	77.60	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	36.80	44.20

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7; New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	Nom.	Nom.	Nom.	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	69.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	62.00	62.50‡	66.50	67.00
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry, K2	89.00
Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Birdsboro, Pa. B10 (Phos. 0.075% max)	$73.00
Lyles, Tenn. T3 (Phos. 0.035% max)	73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Buffalo H1 (Intermediate) (0.036-0.075% max)	71.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Swedeland, Pa. A3 (Intermediate) (Phos. 0.036-0.075% max)	73.00
Troy, N.Y. R2 (Phos. 0.075% max)	73.00

Steel Service Center Products

Representative prices, cents per pound, f.o.b. warehouse, for 2000 lb items (except stainless) ordered by themselves. Prices will vary with total weight of the order or weight of the individual items or both. Base quantities for stainless sheets: 8000 lb, except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb. City delivery charges are 15 cents per 100 lb except; Denver, 20 cents; Baltimore, Boston, New York, Philadelphia, San Francisco, 10 cents; Atlanta, Birmingham, Dallas, Houston, Los Angeles, Seattle, no charge.

	SHEETS				STRIP	BARS				PLATES	
	Hot Rolled	Cold Rolled	Galv.	Stainless Type 302	Hot Rolled	H.R. Rounds	C.F. Rounds	H.R. Alloy 4140	STRUCTURAL SHAPES	Carbon	Floor
Atlanta	9.37	10.61	11.83	....	10.85	9.53	13.24	....	9.94	9.73	11.16
Baltimore	8.27	8.66	10.06	....	8.28	8.95	11.80	16.38	9.53	8.84	10.43
Birmingham	9.43	10.20	10.46	....	10.41	8.26	13.14	16.76	8.47	8.41	10.05
Boston	9.67	10.58	11.77	53.50	12.16	9.77	13.35	16.59	10.16	9.62	11.08
Buffalo	8.80	9.95	11.15	55.98	10.65	9.00	11.45	16.30	9.65	9.00	10.85
Charlotte, N. C.	10.81	11.22	11.34	....	12.29	10.97	12.68	....	11.38	11.17	12.18
Chicago	6.37	10.20	10.95	53.00	7.39	7.00	10.65	15.95	6.96	6.56	9.18
Cincinnati	8.91	10.26	11.00	53.43	10.72	9.16	11.53	16.27	9.89	9.05	10.79
Cleveland	6.37	9.88	11.14	52.33	7.51	7.11	11.25	16.06	7.35	6.80	9.42
Dallas	9.62	10.05	12.59	....	11.18	9.03	12.98	16.95	9.26	9.35	11.00
Detroit	9.00	10.46	11.30	56.50	10.77	9.15	11.01	16.23	9.89	9.04	10.72
Denver	9.41	11.77	12.11	....	9.86	10.10	11.47	....	10.02	9.69	11.83
Houston	9.22	9.65	12.19	52.00	10.78	8.63	13.10	16.55	8.86	8.95	10.60
Indianapolis	9.18	10.64	11.39	....	10.84	9.28	11.09	16.39	9.77	9.11	10.90
Kansas City	9.21	10.87	11.35	....	10.87	9.31	11.57	15.72	9.80	9.10	....
Los Angeles	9.59	11.29	12.20	57.60	11.29	9.67	14.20	17.35	10.54	9.82	11.79
Memphis, Tenn.	9.84	10.05	....	....	11.24	9.92	12.74	....	10.33	10.12	11.41
Milwaukee	8.88	10.34	11.09	....	10.54	8.98	10.89	16.09	9.55	8.81	10.60
Moline, Ill.	9.24	10.70	11.45	....	10.90	9.34	11.15	16.45	9.83	9.17	10.96
Newark, N. J.	9.36	10.13	11.35	....	11.46	9.74	13.25	16.40	10.20	9.51	11.05
New York	9.36	10.13	11.35	53.08	11.46	9.74	13.25	16.40	10.20	9.51	11.05
Philadelphia	8.85	9.60	10.66	52.17	10.85	9.25	11.95	16.38	9.45	9.20	10.45
Pittsburgh	6.37	9.88	11.03	52.33	7.49	7.00	11.25	15.95	6.96	6.56	9.18
Portland, Oreg.	10.20	12.05	12.35	....	12.20	10.20	16.65	17.80	10.80	10.35	12.50
St. Louis	8.84	10.58	11.33	....	10.50	8.95	11.28	16.33	9.45	8.78	10.57
St. Paul	9.00	9.59	10.74	....	10.66	9.12	11.49	16.54	9.63	8.95	10.44
San Francisco	10.17	11.69	11.45	55.10	11.78	10.07	15.10	17.25	10.49	10.38	12.47
Seattle	10.07	11.44	12.05	56.52	11.84	9.96	16.20	17.80	10.59	10.17	12.46
Spokane, Wash	9.92	11.29	11.90	56.52	11.69	9.81	16.20	17.80	10.44	10.02	12.31

Specifications: Hot rolled sheet, sheared edge, 10 Ga. & 36 x 96-120 in.; cold rolled sheets, 20 Ga. & 36 x 96-120 in.; galvanized sheets, 10 Ga. x 36 x 120 in. except Dallas and Houston, 10 Ga. x 48 x 120 in.; hot rolled strip, ⅛ in. x 1 in.; hot rolled carbon bars, rounds, ⅝ in.—1½ in., M1020; cold finished bars, 1 in., C1018; hot rolled alloy bars, 4140 annealed, 1⅝ in.—2⅞ in. rounds; structural shapes, I beams, 6 x 12½ in.; carbon plates, sheared, through ½ in. x 84 in.; floor plates, ¼ in. x 36 in.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry-Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.00.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 straights.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $28-$28.50; barge, Brownsville, Tex., $30-$31.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:
Carbon, Forging Quality (net ton) $97.00
Alloy (net ton) ... 115.00

Wire Rods:
Carbon ⅜" to under ¼ in. 5.30
Carbon, ¼ in. to 47/64 in. 5.70
Alloy 6.40

Wire (Carload lots) .. 8.40

Bars & Small Shapes:
Carbon, merchant quality 5.40
Carbon, special quality 5.85
Alloy 6.40

Bar Mill Bands:
Carbon 5.40
Alloy 8.05

Structural Size Angles & Zees 5.40

Plates:
Carbon 5.45

Sheets & Coils, Hot Rolled:
Carbon Sheets 5.00
Carbon Strip 5.00

Sheets & Coils, Cold Rolled:
Carbon Sheets 6.35
Carbon Strip (0.080 and lighter) 6.35
Carbon Strip (0.081 and heavier) 6.65

Sheets & Coils, Galvanized:
Standard Quality .. 6.70
Culvert Quality 7.00

Sheets, Porcelain Enameling 7.45

Sheets & Coils, Electrical:
Field Grade 9.00
Armature Grade .. 9.50
Electrical Grade .. 10.15

Tin Mill ....(Per Base Box; **Products** 100 lb basis wt)
Coke Tin Plate (1.25 lb pot yield) $10.60
Electrolytic Tin Plate (0.25 lb coating) .. 9.10
Black Plate 8.30

Nails, c-l. lots ....(per keg)
400 keg min. $8.15

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

Cents

Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:
100 mesh, bags 11.50
100 mesh, pails .... 9.85‡
40 mesh, bags .....8.10††

Electrolytic Iron,
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in. 28.75
(In contract lots of 750 tons price is 22.75c)

Annealed, 99.5% Fe..36.75, ton, del. east of Mississippi.

Unannealed (99+% Fe) 33.0

Unannealed (99+% Fe) (minus 325 mesh) .. 58.0

Carbonyl Iron:
90-99.9%, 3 to 20 microns, depending on grade, 88.00-700.00 in standard 200-lb containers; all minus 200 mesh.

Aluminum:
Atomized, 500-lb drum freight allowed, c.l. 39.80; ton lots 41.80

Brass, 80/20, leaded (60 mesh) 40.90

Bronze, filter powder, 90/10 .....47.00*

Copper, all types 15.25*

Lead 7.50*

Manganese, minus 35 mesh $1.00

Nickel ..... $0.95-$1.15

Nickel-Silver, ... 61.70

Solder 15.00*

Stainless Steel, 304 ... 89.00

Stainless Steel, 316 ... $1.07

Steel, AISI 4650 ..... 32.00

Tin 14.00*

Zinc 25.90

Tungsten: Dollars
Carbon reduced, 98.8% min., minus 65 mesh .....nom.**

Molybdenum 4.35

*Plus cost of metal. ‡Depending on mesh. §Cutting and scarfing grades. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.75	$5.65	$5.65	$5.50	$5.85
Bar Size Angles	5.85	5.75	5.75	5.60	5.95
Structural Angles	5.65	5.55	5.55	5.40	5.75
I-Beams	5.60	5.50	5.50	5.35	5.70
Channels	5.60	5.50	5.50	5.35	5.70
Plates (basic bessemer)	6.00	5.90	5.90	5.75	6.10
Sheets, H.R.	7.50	7.55	7.40	7.30	7.65
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.70	9.75	9.60	9.50	9.85
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.60	9.65	9.50	9.40	9.75
Furring Channels, C.R., 1000 ft, ⅝ x 0.30 lb per ft	25.08	24.20	24.42	24.15	25.47
Barbed Wire (†)	6.25	6.15	6.15	6.00	6.35
Merchant Bars	5.85	5.75	5.75	5.60	5.95
Hot-Rolled Bands	6.20	6.10	6.10	5.95	6.30
Wire Rods, Thomas Commercial No. 5	6.40	6.35	6.20	6.20	6.60
Wire Rods, O. H., No. 5	6.55	6.50	6.35	6.35	6.70
Bright Common Wire Nails (§)	8.50	7.40	7.40	7.25	7.65

†Per 82 lb net reel. §Per 100-lb keg, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1960 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer $11.60
Mesabi nonbessemer 11.45
Old Range bessemer 11.85
Old Range nonbessemer 11.70
Open-hearth lump 12.70
High phos. 11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1960, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates ..... nom.

Foreign Iron Ore

Cents per unit

Swedish basic, 65%, c.i.f. Atlantic ports 23.00†
Chilean, 72-75% c.i.f. Atlantic ports .. 22.00
Brazilian 68.5%, f.o.b. vessell Victoria, per ton $11.50

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality $19.00-19.50
Domestic, concentrates, f.o.b. milling points 22.00-23.00

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian, 85-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1 .....$34.00-35.00†
48% no ratio ..... 25.00-28.00†

South African Transvaal

44% no ratio .....18.75†
48% no ratio .....24.00-26.00†

Turkish

48% 3:1 .....36.00-37.00†

Domestic

Rail nearest seller

18% 3:1 .....30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked $1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60% $2.50-2.80
60-65% 2.80-3.20

Vanadium Ore

Cents per lb V_2O_5

Domestic 31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace $14.75-15.25
Connellsville, Pa., foundry 18.00-18.50

Oven Foundry

Birmingham, ovens $30.35
Cincinnati, deld. 33.34
Buffalo, ovens 32.00
Chattanooga, Tenn., ovens 30.80
Detroit, ovens 32.00
Pontiac, Mich., deld. 33.95
Saginaw, Mich., deld. 35.53
Erie, Pa., ovens 32.00
Everett, Mass., ovens:
New England, deld. 33.55*
Indianapolis, ovens 31.25
Ironton, Ohio, ovens 30.50
Cincinnati, deld. 33.54
Kearny, N. J., ovens 31.25
Milwaukee, ovens 32.00
Neville Island (Pittsburgh), Pa., ovens. 30.75
Painesville, Ohio, ovens 32.00
Cleveland, deld. 34.19
Philadelphia, ovens 31.00
St. Louis, ovens 33.00
St. Paul, ovens 31.25
Chicago, deld. 34.68
Swedeland, Pa., ovens 31.00
Terre Haute, Ind., ovens 31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene 31.00
Xylene, industrial grade 29.00
Creosote 24.00
Naphthalene, 78 deg. 6.00
Toluene, one deg. (deld. east of Rockies) 25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade 14.75

Per net ton bulk, f.o.b. cars or trucks, plant.

Ammonium sulfate, regular grade $32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, 10 lb pigs, per gross ton. Palmerton, Pa. 21-23% Mn, $102.50, 19-21% Mn, 1-3% Si, $100; 16-19% Mn, $98. For Neville Island, Pa., prices add $2.50 as of Feb. 1. Lump 35 lb and down: Deduct $2 from 10 lb pig prices at Palmerton.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $220, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va., Ashtabula, Marietta, O.; Rockwood, Tenn.; Houston Tex.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained maganese over 76% or under 74%, respectively (Mn 79-81%). Lump $228 per net ton, f.o.b. Anaconda, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractinos in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 4c for max 0.15% C grade from above prices, 5.3c for max 0.03% C, 6.6c for max 0.5% C, and 8.1c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 24c per lb of contained Mn; packed, carload 25.3c, ton lot 26.9c, less ton 28.1c.

Electrolytic Manganese Metal: Min carload, bulk, 34.25c; 2000 lb to min carload, 37c; less ton, 39c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 11.6c per lb of alloy. Packed, c.l. 12.8c, ton 13.25c, less ton 14.25c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.3c from above prices. For 3% grade Si 12.5-16% deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome: No. 1 (Cr 61-65%, C 5-7%, Si 5-8%), 22.00c.

Blocking Chrome: No. 1 (Cr 61-65%, C 5-7%, Si 5-8%), 22.00c; No. 2 (Cr 58-63%, C 5-6%, Si 8-10%), 23.00c; No. 3 (Cr 58-63%, C 5-6%, Si 10-12%), 23.00c.

Refined Charge Chrome: No. 1 (Cr 50-55%, C 5% max, Si 2% max), 25.00c; No. 2 (Cr 56-60% C 5% max, Si 2% max), 25.00c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 31.50c per lb contained Cr; 0.010% max, 32.50c. Delivered.
Cr 67-71%, carload, lump, bulk, 0.025% max, 34.50c; 0.05% max, 33.50c; 0.10% max, 33.25c; 0.20% max, 33.00c; 0.50% max, 32.75c; 1.0% max, 32.50c; 1.5% max, 32.25c; 2.0% max, 32.00c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered, Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, St 42-45%, C 0.05% max, 26.25c per lb contained Cr and 14.60c per lb contained Si; Cr 33-36%, Si 45-48%, C 0.05% max, 28.25c per lb contained Cr, 14.60c per lb contained Si; 0.75 in. x down, 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (C 99.8% min, metallic basis Fe 0.2% max). Contract, carlot, packed, 2" x D plate (above ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20 max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Chattanooga, Rockwood, Tenn.; Houston, Tex.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk, 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload, $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3% lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 13.7c per lb of briquet; c.l., packed, bags 14.9c; 3000 lb to c.l., pallets 14.9c; 2000 lb to c.l., bags 16.1c; less ton 17c. Delivered. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ⅛ lb of Si). C.l. bulk 14c per lb of briquet; c.l. packed, bags 15.2c; 3000 lb to c.l., pallets 15.2c; 2000 lb to c.l., bags 16.4c; less ton 17.3c. Delivered. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 4% max. C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 44-47% approx, Ta 15% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots, $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carload, bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk, 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (65-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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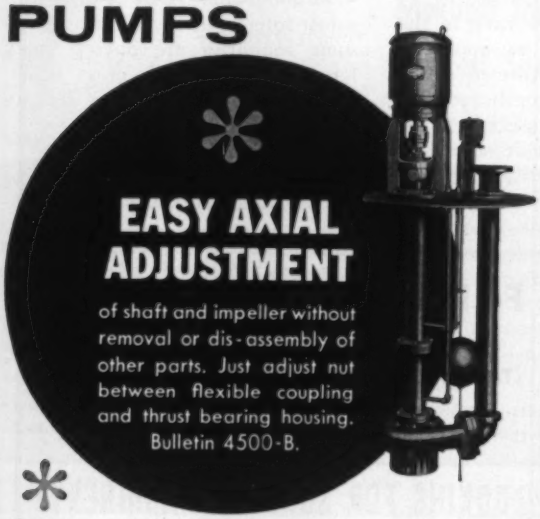

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TOOL COLUMBIA STEELS

Scrap Getting Support from Exports

Third quarter Japanese requirements, exceeding 750,000 tons, provide a bright spot in sluggish market. England to import 100,000 tons. Domestic demand prospects unpromising

Scrap Prices, Page 142

• **Pittsburgh** — Prices are falling, and most observers look for weakness through July. Consumption will hit a low early next month because of long holidays at several mills. Brokers believe scrap offerings on industrial lists will far exceed demand, forcing prices to the lowest levels of the year.

• **Philadelphia**—Domestic demand is light; 95 per cent of the open hearth scrap being collected in this area is going for export at prices estimated to be $3-$4 a ton above domestic levels. Any big tonnage buying by domestic mills would boost open hearth scrap prices sharply and probably stimulate advances on the other grades. However, no large buying is in early prospect.

The outlook for foreign buying continues promising. Japan has contracted for 84 cargoes in this country for shipment in the third quarter. On the average of a 9000-ton cargo, this means a total of 756,000 tons will be shipped to Japan, or about the equivalent of that taken by Japan in the current quarter. In addition, Great Britain plans to import 100,000 tons of scrap (mainly from the U. S.) for delivery in the third quarter.

• **New York**—While prices on the major steel grades are unchanged, brokers have dropped their buying prices on heavy breakable cast $1 to $31-$32, and they have revised their prices on 18-8 sheets, clips, and solids to $170-$175, down $5 a ton. Weakness prevails throughout the stainless steel scrap list. Export demand is bolstering the market for the major grades of steel scrap.

• **Chicago**—Steelmaking grades are holding steady in a listless market. Blast furnace material is down $1 a ton. Machine shop turnings are listed at $13-$14, and it is understood one consumer has declined an offer of material at $13.

Reflecting shrinking operations and backlogs of gray iron foundries and anticipated vacation closings of jobbing shops the next two months, the cast grades of scrap are softer by $2 to $3 a ton.

• **Cleveland**—Prices on the steelmaking grades of scrap are marking time. Quoted levels are largely nominal, representing brokers' and dealers' appraisals. There has been a little additional buying of No. 1 heavy industrial scrap in the Valley at $35. Bids on monthend industrial lists are expected to be down from those a month ago. Indications are the market will be slow through July with steel production curtailed by vacation suspensions.

• **Detroit**—The market is quiet. Projected vacation suspension of the Ford foundries at Dearborn and Cleveland for three weeks in July is depressing the market for the foundry grades of scrap.

• **Boston** — Consumption of the steelmaking grades has declined to the lowest point in years. Brokers' prices are tied to the Eastern Pennsylvania market more than ever before. Only spasmodic demand for export is reported. Yards are well stocked, with prices on the heavy melting grades weak. Cast scrap prices are steadier, but foundries will melt at less than the 70 to 75 per cent of capacity maintained in recent weeks. Freight from Springfield, Vt., to Boston, 40-ton lots, has been reduced to $4.14 a gross ton from $6.51.

• **Cincinnati**—Prices are unchanged but nominal in the absence of a representative buying test. Prospects for an early recovery are not promising because the steelmaking rate is expected to go lower.

• **St. Louis**—Scrap demand is virtually nil here, and plant shutdowns over the coming holiday and for vacations will sharply curtail shipments on old contracts. Dealers hope for a revival in demand during August.

• **Birmingham**—There is little consumer interest in scrap here, though some foundries are buying small tonnages at quoted price levels. Open hearth and electric furnace grades are moving slowly.

• **Buffalo**—The short term outlook for the local market is not encour-

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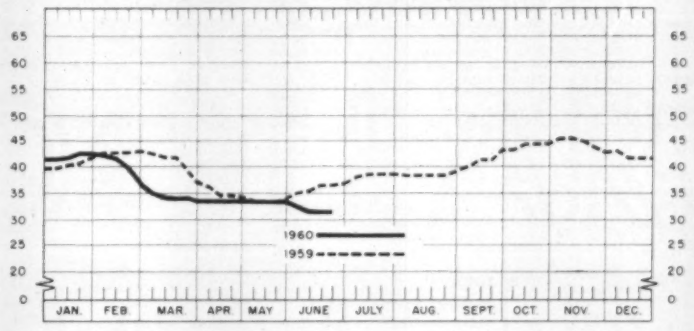
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL.



June 22 1960	Week Ago	Month Ago	Year Ago	May Avg.
$31.33	$31.33	$33.33	$36.50	$33.07

aging. Mill production is slipping, and July orders are expected to reflect the declining ingot rate. The price structure is unchanged, but the market tone is softer. Export buying of No. 1 heavy melting is helping to sustain the price of that grade.

• **Seattle**—Due to the export situation, heavy breakable cast advanced $1 a ton to $34 last week. Other scrap grades held unchanged. There is limited activity in the domestic market, reflecting seasonal influences. Export interest provides some market support.

• **Portland, Oreg.**—Dealers report prices are fairly firm. One exporter is assembling three export cargoes for June shipment, including heavy melting and cast iron. Japanese buyers continue to indicate interest in additional tonnage.

• **San Francisco**—Exports of steel scrap are going strong; but domestic consumption is virtually nil. Export prices are still above official posted quotations.

• **Los Angeles**—The market continues to drift, but foreign shipments are increasing—most are to Japan, some to Mexico.

Wire . . .

Wire Prices, Pages 133 & 134

Wiremakers are operating at a higher level this month than they did in either April or May. Improvement in demand for merchant products is partly responsible. Other factors: Roadbuilding and the construction industries, which were slowed down by a wet spring, are making up for lost time. Demand for baling wire is strong, but fencing and nails are continuing to be held back by imports.

American Steel & Wire Div., U. S. Steel Corp., normally shuts down its plants for vacation periods. This year, its facilities at Waukegan and Joliet, Ill., will continue to operate.

Method for Pricing Zinc Coated Sheets Is Revised

The pricing method for commercial grades of zinc coated sheets has been revised by U. S. Steel Corp., Pittsburgh. Previously, the company had a supplemental price table for commercial weight coatings on flat and formed sheets. It has been incorporated into its width angle thickness table.

The net effect is no change, although for individual widths and thicknesses, the upward and downward changes are less than a half cent per pound.

The move eliminates automatic adjustments for prices on galvanized sheets in line with changes in the price of zinc. It means coated sheets are placed on a basis similar to U. S. Steel's other carbon sheet products.

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, June 22, 1960. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 22	$31.33
June 15	31.33
May Avg.	33.07
June 1959	36.07
June 1955	35.44

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	24.00-25.00
No. 1 busheling	30.00-31.00
No. 1 factory bundles	36.00-37.00
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*13.00-14.00*
Short turnings	*18.00-19.00*
Cast iron borings	*17.00-18.00*
Cut structurals:	
2 ft and under	*37.00-38.00*
3 ft and under	*36.00-37.00*
Heavy turnings	27.00-28.00
Punchings & plate scrap	*39.00-40.00*
Electric furnace bundles	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	*39.00-40.00*
Unstripped motor blocks	*29.00-30.00*
Clean auto cast	*39.00-40.00*
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 2 ft and under	*51.00-52.00*
Rails, 18 in. and under	*52.00-53.00*
Random rails	45.00-46.00
Angles, splice bars	*45.00-46.00*
Railroad specialties	46.00-47.00
Rails, rerolling	*50.00-51.00*

Stainless Steel Scrap

18-8 bundles & solids	200.00-205.00†
18-8 turnings	100.00-105.00†
430 bundles & solids	100.00-105.00†
430 turnings	50.00-55.00†

CHICAGO

No. 1 hvy melt., indus.	30.00-31.00
No. 1 hvy melt., dealer	28.00-29.00
No. 2 hvy melting	25.00-26.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	29.00-30.00
No. 2 bundles	19.00-20.00
No. 1 busheling, indus.	30.00-31.00
No. 1 busheling, dealer	28.00-29.00
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*15.00-16.00*
Shovel turnings	*15.00-16.00*
Cast iron borings	*15.00-16.00*
Cut structurals, 3 ft	*33.00-34.00*
Punchings & plate scrap	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Stove plate	*35.00-36.00*
Unstripped motor blocks	*32.00-33.00*
Clean auto cast	*45.00-46.00*
Drop broken machinery	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
R.R. malleable	*44.00-45.00*
Rails, 2 ft and under	46.00-47.00
Rails, 18 in. and under	47.00-48.00
Angles, splice bars	*40.00-41.00*
Axles	49.00-50.00
Rails, rerolling	49.00-50.00

Stainless Steel Scrap

18-8 bundles, solids	*175.00-180.00*
18-8 turnings	*90.00-95.00*
430 bundles & solids	85.00-90.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	14.00-15.00
No. 1 bundles	28.00-29.00
No. 2 bundles	12.50-13.50
No. 1 busheling	24.00-25.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	9.00-10.00
Shovel turnings	8.00-9.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Stove plate	30.00-31.00
Heavy breakable	30.00-31.00
Unstripped motor blocks	22.00-23.00
Charging box cast	30.00-31.00
Clean auto cast	43.00-44.00

CLEVELAND

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	23.00-24.00
No. 1 factory bundles	34.00-35.00
No. 1 bundles	31.00-32.00
No. 2 bundles	17.00-18.00
No. 1 busheling	31.00-32.00
Machine shop turnings	12.00-13.00
Shovel turnings	16.00-17.00
Mixed borings, turnings	16.00-17.00
Cast iron borings	16.00-17.00
Cut foundry steel	32.00-33.00
Cut structurals, plate 2 ft and under	39.00-40.00
Low phos. punchings & plate	31.00-32.00
Alloy free, short shovel turnings	17.00-18.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Stove plate	39.00-40.00
Unstripped motor blocks	32.00-33.00
Brake shoes	35.00-36.00
Clean auto cast	50.00-51.00
Burnt cast	40.00-41.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	48.00-49.00
Rails, 2 ft and under	50.00-51.00
Rails, 18 in. and under	51.00-52.00
Rails, random length	44.00-45.00
Cast steel	38.00-39.00
No. 1 railroad cast	46.00-47.00
Railroad specialties	45.00-46.00
Angles, splice bars	45.00-46.00
Rails, rerolling	54.00-55.00

Stainless Steel Scrap (Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	185.00-190.00
18-8 turnings	85.00-90.00
430 clips, bundles, solids	90.00-95.00
430 turnings	20.00-30.00

YOUNGSTOWN

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	25.00-26.00
No. 1 busheling	33.00-34.00
No. 1 bundles	33.00-34.00
No. 2 bundles	20.00-21.00
Machine shop turnings	15.00-16.00
Shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00

BUFFALO

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	22.00-23.00
No. 1 busheling	30.00-31.00
Shovel turnings	19.00-20.00
Machine shop turnings	14.00-15.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	41.00-42.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-43.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	44.00-45.00
Rails, 3 ft and under	50.00-51.00
Railroad specialties	41.00-42.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.50-27.50
No. 2 heavy melting	22.50-23.50
No. 1 bundles	26.50-27.50
No. 2 bundles	17.50-18.50
No. 1 busheling	26.50-27.50
Machine shop turnings	10.00-11.00
Mixed borings, turnings	10.00-11.00
Shovel turnings	12.00-13.00
Cast iron borings	12.00-13.00
Low phos. 18 in.	34.00-35.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Heavy breakable cast	32.00-33.00
Charging box cast	36.00-37.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	45.00-46.00

PHILADELPHIA

No. 1 heavy melting	34.00
No. 2 heavy melting	30.00
No. 1 bundles	36.00
No. 2 bundles	20.00
No. 1 busheling	36.00
Electric furnace bundles	37.00
Mixed borings, turnings	17.00†
Shovel turnings	21.00†
Machine shop turnings	15.00
Heavy turnings	28.00
Structurals & plates	38.00-40.00
Couplers, springs, wheels	40.00
Rail crop, 2 ft & under	56.00-57.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	40.00
Drop broken machinery	51.00-52.00
Malleable	51.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	31.00-32.00
No. 2 bundles	16.00-17.00
Machine shop turnings	7.00-8.00†
Mixed borings, turnings	8.00-9.00†
Shovel turnings	9.00-10.00†
Low phos. structurals & plates	38.00-39.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	*31.00-32.00*

Stainless Steel

18-8 sheets, clips solids	*170.00-175.00*
18-8 borings, turnings	80.00-85.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00-25.50
No. 2 heavy melting	22.00-23.00
No. 1 bundles	25.00-25.50
No. 1 busheling	25.00-25.50
Machine shop turnings	6.00-7.00
Shovel turnings	9.00-10.00
No. 1 cast	39.00-40.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	40.00-42.00

BIRMINGHAM

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	28.00-29.00
No. 2 bundles	17.00-18.00
No. 1 busheling	31.00-32.00
Cast iron borings	10.00-11.00
Machine shop turnings	18.00-19.00
Shovel turnings	20.00-21.00
Bar crops and plate	37.00-38.00
Structurals & plate	36.00-37.00
Electric furnace bundles	32.00-33.00
Electric furnace:	
3 ft and under	32.00-33.00
2 ft and under	33.00-34.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	47.00-48.00
Unstripped motor blocks	37.00-38.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	28.00-29.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	40.00-41.00
Angles, splice bars	39.00-40.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	31.00†
No. 2 heavy melting	28.00†
No. 1 bundles	33.00†
No. 2 bundles	19.00†
No. 1 busheling	33.00†
Machine shop turnings	10.00†
Shovel turnings	12.00†

Cast Iron Grades

No. 1 cupola	45.00†
Charging box cast	37.00†
Heavy breakable cast	35.00†
Unstripped motor blocks	35.00†
Clean auto cast	47.00†
Stove plate	39.00†

Railroad Scrap

No. 1 R.R. heavy melt.	34.00†
Rails, random lengths	40.00†
Rails, rerolling	50.00†
Rails, 18 in. and under	43.00†
Angles, splice bars	41.00†

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 2 bundles	19.00
Machine shop turnings	13.00-13.50
Low phos. plate & structurals	38.00-39.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable	27.00†
Foundry malleable	31.00†
Unstripped motor blocks	31.00-32.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00†

LOS ANGELES

No. 1 heavy melting	37.00
No. 2 heavy melting	34.00
No. 1 bundles	35.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Shovel turnings	18.00
Cast iron borings	15.00
Cut structurals and plate 1 ft and under	42.00

Cast Iron Grades

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-34.00

PORTLAND, OREG.

(Prepared, f.o.b. car)

No. 1 heavy melting	35.00-38.00
No. 2 heavy melting	32.00-35.00
No. 2 bundles	20.00
Shovel turnings	15.00
Electric furnace bundles	48.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable	33.00
Unstripped motor blocks	33.00
Stove plate (f.o.b. plant)	20.00

SEATTLE

(Prepared, f.o.b. car)

No. 1 heavy melting	38.50
No. 1 hvy (unprepared)	33.00
No. 2 heavy melting	35.50
No. 2 hvy (unprepared)	30.00
No. 2 bundles	23.00
Shovel turnings	15.00
Electric furnace bundles	48.00

Cast Iron Grades

No. 1 cupola	35.00
Heavy breakable cast	*34.00*
Unstripped motor blocks	33.00
Stove plate (f.o.b. plant)	20.00

SAN FRANCISCO

No. 1 heavy melting	34.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	20.00
Machine shop turnings	14.00
Mixed borings, turnings	14.00
Cast iron borings	14.00
Heavy turnings	14.00
Shovel turnings	14.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices; net tons)

No. 1 heavy melting	25.80
No. 2 hvy. melt, 2 ft & under	25.50
No. 1 bundles	25.80
No. 2 bundles	19.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Busheling, new factory:	
Prepared	25.50
Unprepared	20.45
Shovel turnings	12.00

Cast Iron Grades‡

No. 1 machinery cast	43.00

†Nominal.
‡F.o.b. Hamilton, Ont.

YOUR DOLLAR CAN HELP THE U.S. TEAM WIN IN ROME

The possibility of the U.S. team winning the 1960 games in Rome this year depends to a great extent on what funds are available. The team needs money to help it achieve championship status. Many other countries, like Russia, finance their Olympic teams with government subsidies. The U.S. does not do this. Your dollar is needed. It is needed now to help the U.S. team win at Rome!

Get this souvenir postcard mailed to you direct from Rome, Italy

To acknowledge your contribution, arrangements have been made to send a special Olympic souvenir postcard to you or anyone you may specify. This postcard will bear a special Italian commemorative Olympic stamp. It will be mailed direct from Rome, Italy to you or anyone you specify . . . and will be autographed by leading members of the U.S. team.

The U.S. team needs funds to help them seek out the top U.S. athletes. To train them. To transport them to Italy. And to feed, clothe and house them while they are participating in the Olympic Games. You and others like you are the sole support of the U.S. team. Please mail your contribution today.

Donations are deductible on income tax returns.

MAIL YOUR DOLLAR TODAY!

Olympic, National Headquarters, Olympic House, 57 Park Ave., New York 16, New York

I want to help the U. S. team win the 1960 Olympic Games. Here is my $1.00 donation. Please put my name on the mailing list for the special Olympic autographed souvenir postcard.

*Name*_____

*Address*_____

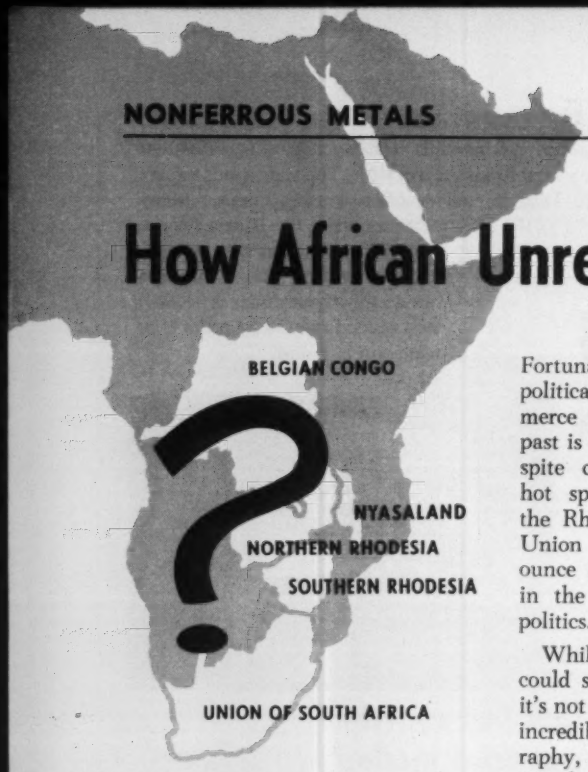
*City*_____ *Zone*____ *State*_____

LARGER DONATIONS GRATEFULLY ACCEPTED

Preparation Costs of This Announcement Donated by These Chicago Companies: **J. M. Bundscho, Inc.,** *Typography* • **Schreiner-Bennett, Inc.,** *Art Work* **Rapid Copy Service, Inc.,** *Photostats* • **Rogers Engraving Co.,** *Engravings* • **National Electrotype Co.,** *Plates*

This Space Donated by STEEL

How African Unrest Could Affect You



OMINOUS rumblings of undisciplined nationalism and behind-the-scenes power struggles are casting a shadow over the metals-rich areas of south central Africa. On July 1, the Belgian Congo receives its independence, and probably never before has a new nation been less prepared for self-government. Widespread confusion and turmoil are expected because the people have no national cohesion or unanimity of aims.

A large part of the Dark Continent has been plagued with such unrest and tension in recent years. And, significantly, what happens in Africa will have a direct effect on producers and users of nonferrous metals in this country. Africa, and particularly the area from the Belgian Congo south, has fabulous mineral wealth and is one of the world's most important suppliers of copper, lead, zinc, cobalt, uranium, gold, silver, diamonds. In fact, you name it, and Africa has it in abundance. Farther to the north and east, around Guinea and Ghana, is an area that may become the major aluminum producing region.

Any serious dislocation of African metals production, particularly copper, will have a sharp effect on both supplies and prices in the U. S. Fortunately, odds are good that the political turmoil won't upset commerce too much, especially if the past is any guide to the future. Despite continuing agitation in the hot spots of the Belgian Congo, the Rhodesian Federation, and the Union of South Africa, not an ounce of production has been lost in the last two years because of politics.

While a flare-up in one country could start a brush fire in another, it's not too likely. Africa has such an incredible diversity of climate, geography, customs, religions, and politics that the countries can no more be lumped together as a whole. One African expert sums it up: "I just can't foresee any federation of African nations, at least not for generations."

• **Belgian Congo**—The situation is beyond analysis. There could be anything from a three day holiday to six months or more of turmoil and a complete breakdown of commerce. The tragedy of the Belgian Congo is that tribalism is rampant. It means that a new nation could go off in any of a dozen different directions.

Fortunately, the rich mines in this sprawling country of 905,400 square miles are in the Katanga region—the extreme southeast corner of the nation. They are away from the center of controversy. The region annually produces about 300,000 tons of copper, over 50 per cent of the world's cobalt, and sizable quantities of uranium, lead, and zinc. Probable outlook in the Congo: Administrative confusion, isolated cases of violence, little interruption in production in the Katanga area.

• **The Rhodesias**—Just a few miles to the south of Katanga lies Northern Rhodesia's famed copper belt. The richest copper properties in the world are squeezed in an area about one-half the size of Long Island. They can turn out close to 600,000 tons of metal yearly, or better than 20 per cent of the Free World's supply. The properties also produce lead, zinc, silver, cobalt.

In Northern Rhodesia, where 96 per cent of the land is reserved for the Africans, there is pressure from the white settlers for a white-dominated government. But odds seem to favor ultimate independence, with a black African majority running the country. Censorship and other restrictions create a semi-police state atmosphere, but the natives still have relatively more freedom here than in many other areas. Consequently, because there is more freedom, Northern Rhodesia will have more short term turmoil than some other regions.

Southern Rhodesia, important in chrome, asbestos, and gold, is organized along a policy of racial segregation, like South Africa, but unlike South Africa, it is improving relations with the black majority.

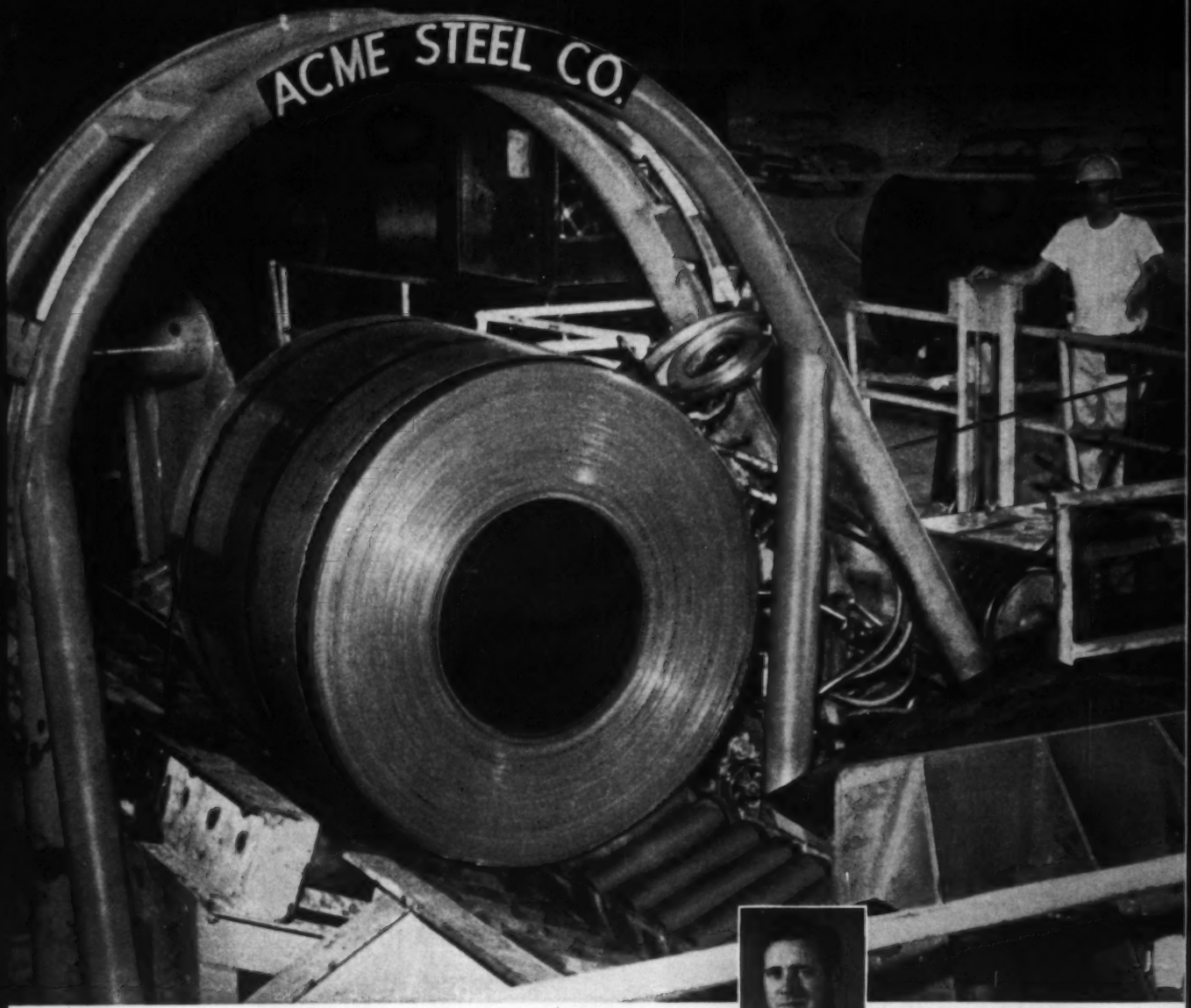
Odds look good for minerals production in the Rhodesias.

• **South Africa** — The Union of South Africa is caught up in the throes of a peculiar form of political madness that has been described as "lukewarm Nazism." The Afrikaners, who have a stern 17th century Calvanist morality, are bent on suppressing the Africans and dominating the English speaking portion of the white population.

Despite political turbulence, production should stay stable—partly because of the importation of mine workers from other areas and their segregation in compounds. South Africa produces about 70,000 tons of copper yearly and by far the largest amounts of gold and diamonds of any nation.

Southwest Africa, to which the United Nations claims a trusteeship, but which is administered by South Africa, produces copper, lead, zinc, silver, cadmium, and germanium. Its political climate is similar to South Africa's.

STRAPS SIZZLING COILS BY REMOTE CONTROL!



Acme Idea Man William Whyte helped develop Idea No. U8-1, at Dominion Foundries and Steel, Ltd., Hamilton, Ont.

One of Canada's leading basic steel producers keeps in step with increased coil-making capacity with a first-of-its-kind tying method engineered by Acme Steel—the F5 Strapping Machine.

This new innovation is customized into a push-button automatic, remote controlled strapping station. It ties 5 to 14 ton hot coils in 12 seconds! Operation is simple and safe. Strapping is applied, tightened to uniform tension, sealed and cut—all by one push-button.

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Acme Steel Products Division
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Please send me Idea No. U8-1 and examples of how major companies in my field use Acme Steel Strapping.

*Name*_____

*Title*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 25.60; No. 43, 25.90; No. 195, 30.70; No. 214, 31.50; No. 356, 26.30. 30 lb ingots; 10 lb ingots, add 0.4 cent per lb; 6 lb ingots, add 0.6 cent per lb.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.00-26.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $65 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment data, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.50 per lb deld.

Cobalt: 99+%, $1.50 per lb for 500-lb keg, $1.52 per lb for 100 lb case; $1.57 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 33.00 deld.; custom smelters, 33.00; lake, 33.00 deld.; fire refined, 32.75 deld.

Germanium: First reduction, ingots, less than 1 kg, 36.00-37.50 per gram; 1-10 kg, 30.50-32.00 per gram; 10 kg or more, 28.10-29.99 per gram; intristic grade, under 10 kg, 31.95 per gram; 10 kg or more, 29.95 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 24 lb, $11 per lb f.o.b. Minneapolis; 24-99 lb, $9.50; 100-449 lb, $9.25; 450 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex., 1.3 in. diam. x 12 in. sticks, 57.00 f.o.b. Madison, Ill.

Magnesium Alloy: AZ91A (diecasting), 40.75; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $209-211 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, in kegs, 74.50; "F" nickel, 5 lb ingots, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-90 per troy oz nom.

Palladium: $24-26 per troy oz.

Platinum: $82-85 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $137-140 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l, 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom; sheet, $55 per lb nom.

Tellurium: $3.50 per lb, 100 lb or more.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, and prompt, 101.875.

Titanium: Sponge, 99.3+% grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb. add 15.00; 99+% hydrogen reduced, $3.50-4.25.

Zinc: Prime western, 13.00; brass special, 13.25; intermediate, 13.00, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 14.50; special high grade, 14.75 deld. Diecasting alloy ingot No. 3, 16.25; No. 2, 16.75; No. 5, 16.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7 per lb; over 500 lb, $6.50 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.25-28.00; No. 12 foundry alloy (No. 2 grade), 23.75-25.00; 5% silicon alloy, 0.60 Cu max., 25.00-25.25; 13 alloy, 0.60 Cu max., 25.00-25.25; 195 alloy, 26.75-27.75; 108 alloy, 24.25-25.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.00; grade 2, 23.75; grade 3, 22.75; grade 4, 22.25.

Brass Ingot: Red brass, No. 115, 29.25; tin bronze, No. 225, 39.50; No. 245, 34.00; high-leaded tin bronze, No. 305, 33.75; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 28.25.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.25; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.975, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.955, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 38.35; l.c.l, 38.98. Weatherproof, 20,000-lb lots, 38.55; l.c.l., 39.30.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $6.75-15.50; sheared mill plate, $5.25-9.00; wire, $5.55-9.50; forging billets, $3.20-4.75; hot-rolled and forged bars, $3.80-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 28.00; ribbon zinc in coils, 22.50; plates, 21.50.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

(Selected products and sizes)

Flat Sheets: 1100, 3003, and 5005, mill finish, 30,000 lb base f.o.b. customer custody.

Thickness Range (in.)	Width (in.)	Length Range (in.)	Price Range
0.250-0.136	24-72	72-180	45.10-47.70
0.136-0.096	24-72	72-180	45.50-48.70
0.096-0.077	24-72	72-180	46.20-50.00
0.077-0.068	24-72	72-180	46.70-51.70
0.068-0.061	24-72	72-180	46.70-55.50
0.061-0.048	24-72	72-180	47.30-57.30
0.048-0.038	24-72	72-180	47.80-60.20
0.038-0.030	24-72	72-180	48.20-65.30
0.030-0.024	24-60	72-180	48.70-56.60
0.024-0.019	24-60	72-180	49.40-59.90
0.019-0.017	24-48	72-144	50.30-57.00
0.017-0.015	24-48	72-144	51.20-58.00
0.015-0.014	24-36	72-144	52.30
0.014-0.012	24-36	72-144	53.50
0.012-0.011	24-36	72-144	54.60
0.011-0.0095	24-36	72-144	56.20
0.0095-0.0085	24-36	72-96	57.50
0.0085-0.0075	24-36	72-96	59.20
0.0075-0.007	24-36	72-96	60.80
0.007-0.006	24-36	72-96	62.50

ALUMINUM (continued)

Plates and Circles: Thickness, 0.25-3 in.; width or diam., 24-60 in.; lengths, 72-240 in., mill finish.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	44.60	49.40
5050-F	45.70	50.50
3004-F	46.70	52.40
5052-F	47.30	53.10
6061-T6	47.80	53.90
2024-T4	51.80	58.90
7075-T6*	60.50	67.90

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base, 12 ft

Diam.	Round		Hexagonal	
(in.)*	2011-T3	2017-T4	2011-T3	2017-T4
0.125	72.90	75.80	....	....
0.188	....	....	....	78.20
0.250	58.00	61.60	70.70	72.30
0.375	57.20	62.40	69.00	70.50
	2011-T3	2017-T451	2011-T3	2017-T451
0.500	57.20	62.40	69.00	70.50
0.625	57.20	62.40	65.80	66.60
0.750	55.70	60.70	59.60	62.60
0.875	55.70	60.70	59.60	62.60
1.000	55.70	60.70	59.60	62.60
1.125	53.30	58.30	57.50	60.40
1.250	53.30	58.30	57.50	60.40
1.375	53.30	58.30	57.50	60.40
1.500	53.30	58.30	57.50	60.40
1.625	51.00	55.60	....	58.20
1.750	51.00	55.60	56.30	58.20
1.875	51.00	55.60	....	58.20
2.000	51.00	55.60	56.30	58.20
2.250	49.50	54.00	....	58.20
2.500	49.50	54.00	....	58.20
2.750	47.90	52.20	....	58.20
3.000	47.90	52.20	....	58.20
3.250	....	52.20	....	....
3.375	....	52.20	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 47.20-56.90; 6061, 43.20-56.90; 7075, 61.50-71.20; 7079, 66.50-76.20.

Pipe: ASA schedule 40, alloy 6063-T6, 3-40 ft lengths, plain ends, 90,000 lb base, dollars per ft. Nominal pipe sizes: 1 in., 31.55; 1¼ in., 42.75; 1½ in., 51.05; 2 in., 61.70; 3 in., 123.40; 4 in., 169.55; 5 in., 229.60; 6 in., 304.60; 8 in., 458.40; 10 in., 706.45 (3-24 ft lengths).

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
1-14	44.70-46.20	53.20-59.00
15-17	44.70-46.20	55.60-60.80
18-23	45.20-46.80	57.70-66.40
24-32	45.20-46.80	65.60-78.80
33-38	48.80-51.40	82.30-93.40
39-44	58.70-62.40	99.90-121.00

MAGNESIUM

Sheets and Plates: AZ31B standard grade, .032 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.00 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	94.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-68.40	90.60-91.30
36-38	71.50-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 23.00-23.50; No. 2 heavy copper and wire, 20.00-20.50; light copper, 18.00-18.50; No. 1 composition red brass, 17.00-17.25; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 30.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	50.00b	54.86c	....	58.32	29.000	29.000	28.250
Yellow Brass	50.57	36.06d	50.86	54.23	22.250	21.250	20.250
Low Brass, 80%	53.53	53.22	53.82	57.09	24.750	24.500	24.000
Red Brass, 85%	54.58	54.27	54.87	58.14	25.750	25.500	25.000
Com. Bronze, 90%	56.17	55.86	56.46	59.48	26.750	26.500	26.000
Manganese Bronze	58.86	52.21	62.69	....	20.875	26.625	19.875
Muntz Metal	53.20	48.26	....	....	20.875	20.625	20.125
Naval Brass	55.12	48.68	61.43	58.78	20.750	20.500	20.000
Silicon Bronze	62.86	61.80	62.15	80.79	28.375	28.125	27.375
Nickel Silver, 10%	65.98	68.06	68.06	....	26.875	26.625	14.937
Phos. Bronze	77.44	78.19	77.69	79.37	29.875	29.625	28.625

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 15.50-15.75; new brass clippings, 14.00-14.50; light brass, 10.50-10.75; heavy yellow brass, 11.50-11.75; new brass rod ends, 12.50-12.75; auto radiators, unsweated, 12.50-12.75; cocks and faucets, 13.50-14.00; brass pipe, 14.00-14.50.

Lead: Soft scrap lead, 8.00-8.25; battery plates, 3.00-3.25; linotype and stereotype, 9.00-9.50; electrotype, 8.00-8.25; mixed babbitt, 9.50-10.00.

Monel: Clippings, 23.00-24.00; old sheets, 22.00-23.00; turnings, 16.50-17.50; rods, 22.00-23.00.

Nickel: Sheets and clips, 50.00-51.00; rolled anodes, 50.00-51.00; turnings, 39.00-41.00; rod ends, 50.00-51.00.

Zinc: Old zinc, 4.00-4.50; new diecast scrap, 4.00-4.50; old diecast scrap, 2.00-2.25.

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 6.50-7.00; segregated low copper clips, 14.00-14.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 14.00-14.50; mixed high copper clips, 12.00-12.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 8.00-8.50; segregated low copper clips, 15.50-16.00; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.00-14.50; mixed high copper clips, 13.50-14.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.75-15.00; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.00-14.50; mixed high copper clips, 13.50-14.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 59.00; light scrap, 54.00; turnings and borings, 39.00.

Copper and Brass: No. 1 heavy copper and wire, 27.00; No. 2 heavy copper and wire, 25.00; light copper, 22.75; refinery brass (60% copper) dry copper content, 23.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.00; No. 2 heavy copper and wire, 25.00; light copper, 22.75; No. 1 composition borings, 20.50; No. 1 composition solids, 21.50; heavy yellow brass solids, 15.50; yellow brass turnings, 14.00; radiators, 16.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.50.

Copper: Flat-rolled, 50.04; oval, 46.50, 5000-10,000 lb, electrodeposited, 42.00, 2000-5000 lb lots; cast, 44.50, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 1000 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 120.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.

Zinc: Balls, 20.50; flat tops, 20.50; flats, 23.25; ovals, 22.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.50 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,000 lb, 61.90.

Copper Sulphate: 100-1900 lb, 16.00; 2000-5900 lb, 14.00; 6000-11,900 lb, 13.75; 12,000-22,900 lb, 13.50; 23,000 lb or more, 13.00.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,900 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 79.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more, 64.20.

Stannous Chloride (Anhydrous): 25 lb, 155.00; 100 lb, 150.10; 400 lb, 147.70; 800-19,900 lb, 106.80; 20,000 lb or more, 100.70.

Stannous Sulphate: Less than 50 lb, 140.20; 50 lb, 110.20; 100-1900 lb, 108.20; 2000 lb or more, 106.20.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 141*)

Belgian Steel Cargo Delivered at Albany

The German freighter, *Kurt Arlt*, recently docked at the Port of Albany (N. Y.) with a cargo of Belgian steel for six area firms. The shipment included 1006 tons of structural steel and reinforcing bars.

It was reported that the Albany Steel & Iron Supply Co. will get 743 tons; Leo Nash Corp., Pittsfield, Mass., 100 tons; Goldberg Building Material Corp., Troy, N. Y., 75 tons; Gerrity Co. Inc., Albany, 45 tons; West Side Structural Co., Watervliet, N. Y., 38 tons, and Mohawk Steel Co., 5 tons.

Ferro-Union Corp., New York, was the broker for the shipment, and All-Transport Inc., Albany, was freight agent.

Stainless Steel . . .

Stainless Steel Prices, Page 135

Price easiness in stainless steel tubing is reported. About two months ago, an Eastern maker reduced prices on heat exchanger tubing (⅝ to 2 in.). Last week, another maker reduced its prices on pipe and tubing. Reductions average 15 per cent, but they range up to 28 per cent. Sizes: ⅝ to 2 in.

It's not certain whether the reductions will be generally followed by other producers. Several mills say they have the matter under study.

Distributors . . .

Prices, Page 136

U. S. Steel Supply Div., U. S. Steel Corp., last week revised its service center prices on hot rolled products at Pittsburgh, Chicago, and Cleveland. Some prices were raised, others reduced in the new schedule, but the net result is an over-all reduction.

The action follows similar moves by other leading operators of steel service center chains, including Jones & Laughlin and Joseph T. Ryerson & Son Inc. Reductions are said to run around $7 a ton overall.

A pickup in steel service center business is not expected until late summer. Because of seasonal influences and restricted activity in some consuming industries, consumption will be slow in July and only slightly improved in August. Stocks in all lines are plentiful.

Drum, Barrel, and Pail Shipments Rise in March

Shipments of steel shipping barrels and drums in March totaled 2,450,223 tons, up 15 per cent from February's total, but down 15 per cent from shipments in March, 1959, reports the U. S. Census Bureau. The cumulative total for the first quarter this year was 7,212,555 tons vs. 8,051,601 in the like period last year.

The movement of steel pails in March was 5,584,186 tons, up 9 per cent from the preceding month, but off 16 per cent from March a year ago. Shipments in the first quarter amounted to 16,139,471 tons vs. 17,128,600 in the like 1959 period.

Plates . . .

Plate Prices, Page 131

Apparent settlement of the five month strike at eight Eastern shipyards of Bethlehem Steel Co. promises improvement in plate consumption. Otherwise, the immediate outlook continues to be discouraging.

Heavy tankwork, line pipe construction, railroad equipment needs, and agricultural equipment re-

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quirements remain sluggish. Electrical equipment specifications, however, are not too bad, and in some areas, boiler demand appears a little livelier. Over-all, though, the market remains quiet, with sheared plates available for delivery in two to three weeks.

Semifinished Steel . . .

Semifinished Prices, Page 131

Steelmaking operations are expected to hit a low point next month when many works suspend for varying periods to permit mass vacations. Suspensions will start around July 4 and continue for some time thereafter. Some plants may extend layoffs beyond the usual vacation period.

Generally, most steelmakers are expected to follow the policy of previous years. In the Midwest, Wisconsin Steel Div., International Harvester Co., has announced its South Chicago plant will be closed for a week or ten days after July 4. Inland Steel Co. is considering suspending for four days. Other area companies expect to suspend finishing operations over the holiday but to continue steel production.

Columbia Tool Steel Co. normally shuts down its Chicago Heights, Ill., plant for vacation. This year, it will close for three weeks—from July 1 to July 25. Continental Steel Corp., Kokomo, Ind., will close its semifinished operations for a three-week repair period beginning Aug. 14.

July suspensions at producing plants in the East will range from one to two weeks in the open hearth divisions and even longer in some of the rolling departments. These plants include Alan Wood Steel Co., John A. Roebling's Sons Div., Colorado Fuel & Iron Corp., Phoenix Steel Corp., and Midvale-Heppenstall Co. Other district producers will grant vacations on a stagger system, as has been their custom in the past.

Crucible Steel Co. of America's main steelmaking facilities at Midland, Pa., will be idled for two weeks in July to allow electrification of the blooming mill. During the same two weeks, beginning July 3, its Sanderson-Halcomb Works, Syracuse, N. Y., will be closed for mass vacations.

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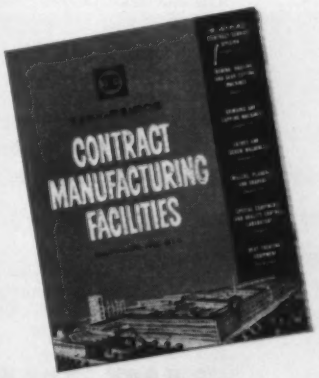

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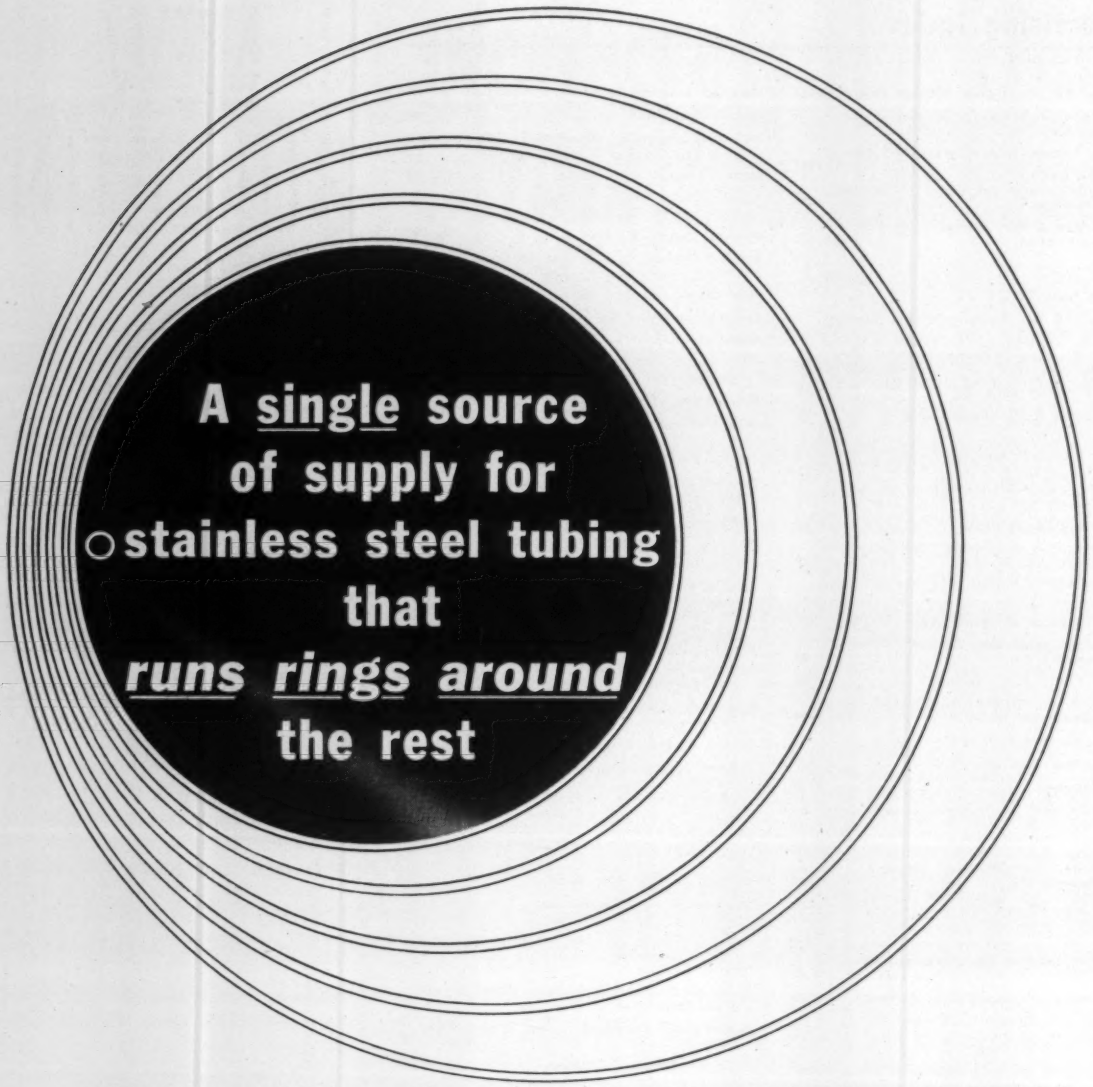

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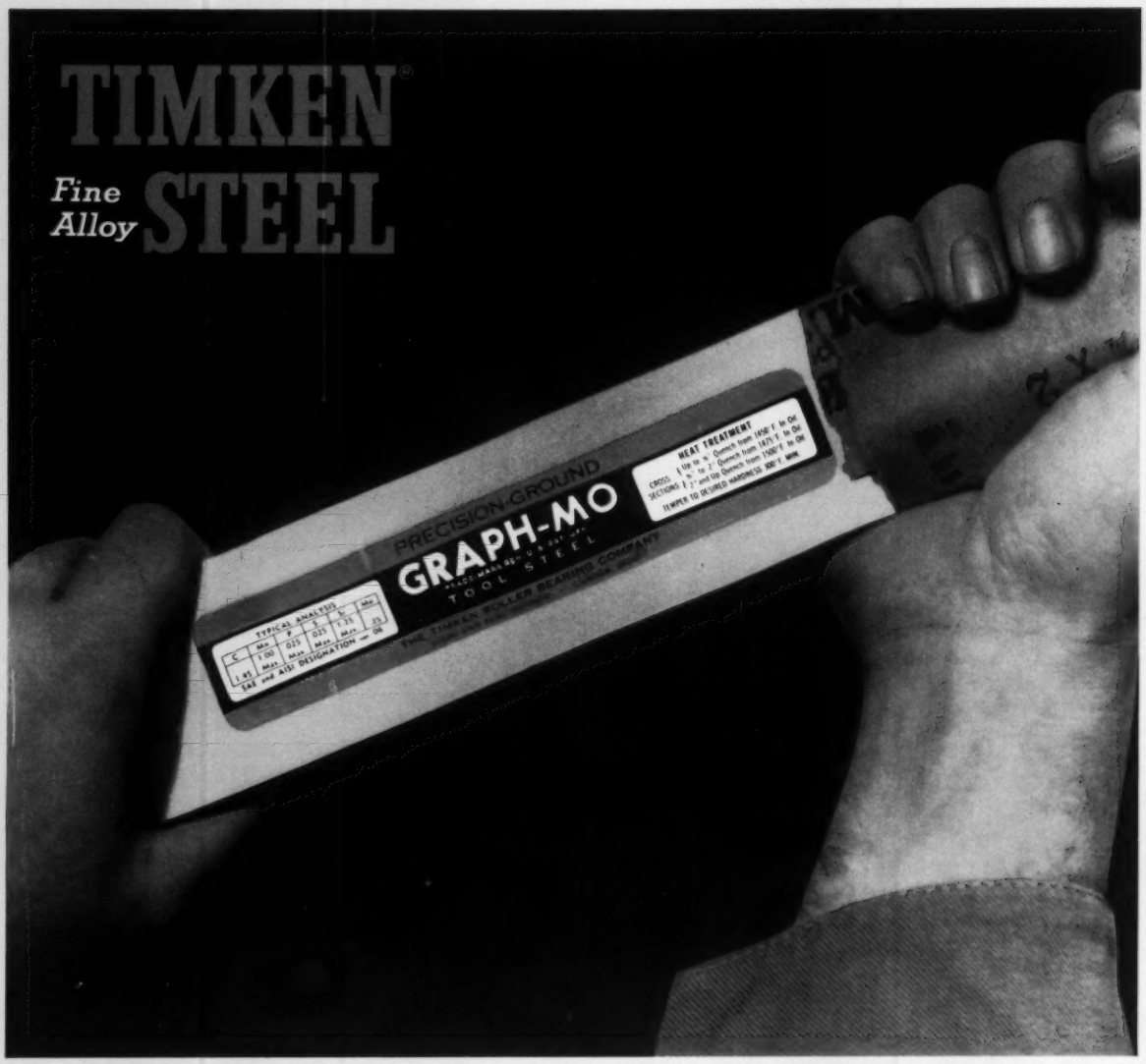

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